INFO WORLD

OCTOBER 15, 1990 FOR POWER BUYERS OF PC AND NETWORKING PRODUCTS VOLUME 12, ISSUE 42

FROM THE TEST CENTER



Backup for Safe Keeping

InfoWorld puts seven backup software utilities to the test.

See Page 67

AMD Clone Prospects: The Long and the Short of It

- Intel is primarily at fault for breaching the 1982 contract. But the decision about the rights to the 386 and the 8087 math coprocessor will be determined in the "remedies module" phase of the deliberation, which begins on November 15.
- If AMD is awarded rights to the 386 microcode, Intel will no longer have a monopoly on the 386 or 486 market.
- Even before the remedies module is decided, AMD could announce "Longhorn," a re-engineered 386DX, and "Shorthorn," a re-engineered 386SX chip. Longhorn is being sampled, while Shorthorn has yet to be sampled.

After years of wrangling over rights to the microcode, AMD is readying 386 DX and SX clones for 1991 deliveries.

Intel Breached Pact; AMD Preps 386 Clone

BY MARTIN MARSHALL AND RON COPELAND

The long-standing dispute over rights to the 80386 took a step toward resolution last week when an arbitrator ruled Intel had breached its technology exchange contract with Advanced Micro Devices — raising the possibility that AMD may earn access to the chip.

The two firms submitted to an arbitrated settlement following years of suits and countersuits. At stake is AMD's claim that Intel broke its 1982 contract by not allowing AMD to manufacture Intel's 80386 chips and math coprocessors.

Both sides claimed victory in Judge J. Barton Phelps' arbitration ruling, but the real awards will be determined in the remedies phase of deliberations.

See AMD, Page 121

Apple Stakes Future On Lower Priced Macs

BY KRISTI COALE AND TOM QUINLAN

Starting today, computer buyers will discover that buying a Mac won't leave their wallets as light as they have come to expect.

This development is the courtesy of Apple Computer's new pricing structure, launched today with the rollout of its low-end offerings. The Macintosh Classic, Macintosh LC, and Macintosh IIsi have base configurations priced at $1,499, $2,499, and $3,769, respectively. (For detailed specifications, see chart, Page 8.)

Touted by many as a real price breakthrough, an alternative configuration for the Classic features the 1.44-megabyte Superdrive, a standard across all the new Macs, along with 1 megabyte of RAM and no internal hard disk for a list price of $999.

The LC and IIsi extend the Mac's sound functionality with a built-in microphone and audio digitizer.

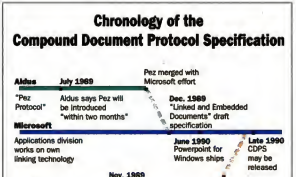
Also available starting today



are three new monitors: a 12-inch monochrome, a 12-inch RGB, and a new Apple Color high-resolution RGB display; Nubus and Direct Slot/30

See Macs, Page 8

Chronology of the Compound Document Protocol Specification



An upcoming specification for compound documents will combine Lotus' hot links proposal and Microsoft's DDE technology.

Interoperability Garners Rising SNMP Support

BY JODI MARDESICH AND DAVID COURSEY

SAN JOSE, CA — The ground swell to adopt SNMP (Simple Network Management Protocol) rose higher last week at Interop 90 as networking vendors, including Banyan Systems and Novell, announced support for the protocol.

SNMP was center stage at last week's show here, playing a central role in a demonstration of interoperability as well as in product announcements. To prove SNMP is the best tool

See SNMP, Page 121

Fox Bucks SQL Database Trend, Demonstrates Foxpro-Based Server

BY SCOTT MACE

TOLEDO, OH — Nearly 900 PC application developers last week heard a message from Fox Software tailor-made for those disenchanted with SQL.

Fox became the largest non-SQL company yet to propose building a PC database server, but its proposal is not based on set-oriented SQL but on record-oriented Foxpro.

Fox demonstrated key query optimization that the company says will make current Dbase applications outperform other vendors' SQL systems in a client/server environment, while at the same time allowing optional use of SQL for specific tasks and connectivity.

This notion flies in the face of proposals by companies such as Oracle, Gupta Technologies, and Sybase that only SQL technology and relational databases will be adequate for on-line transaction processing and client/server applications.

"The bottom line is, let's forget about impressions, let's forget about theories, let's talk

See Fox, Page 8

Lotus, Microsoft Agree to Standard Document Links

BY STUART J. JOHNSTON

Arch rivals Lotus and Microsoft are merging their competing technologies to allow users to create high-level links between applications into a single standard.

The merged technology, called the Compound Document Protocol Specification (CDPS), is nearly complete and may be released to ISVs late this year, said Viktor Grabner, a technology evangelist in Microsoft's systems division.

CDPS, which combines the Lotus and Word Perfect "hot link" technology announced last year with Microsoft's "Linked and Embedded Documents" specification, extends Dynamic Data Exchange (DDE) — a dynamic linking technology in both Windows and OS/2. The technology will provide dynamic links between text and graphics files.

Once it is supported in vendors' applications, CDPS will enable users to double-click on a graphic that has been pasted into a word processor docu-

See Lotus, Page 121

THIS WEEK



PERSPECTIVES. Enterprise computing is the next wave of computing strategies.

IMPRESSIONS. This week's revised section brings more, shorter Impressions and Michael J. Miller's First Look column.

BUYERS ADVISORY PAGE. We also debut a new section with Brett Glass' Answer Line column.

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TRW



Compaq offers 386SX power in a 7½-pound notebook with VGA and a hard drive 21



The Picture Press Accelerator board and software compress graphics files at 60 MIPS 44



Soft Warehouse president Nathan Morton offers PC products in a discount-store setting... 46

AT DEADLINE

Turbo Pascal 6.0 to Ship With 'Apps Framework'

Borland International's Turbo Pascal 6.0, which will feature an object-oriented "application framework" to speed creation of programs by providing inheritable user interface features, will be rolled out November 5, according to the company. The update will also feature the Programmer's Platform multiwindowing development environment, additional object-oriented extensions, 286 code generation, and an in-line assembler.

— Stuart J. Johnston

Apple to Release Updated Hypercard

Apple will release Hypercard 2.0 with its new models today. According to Apple and Claris, this bundled software is a full-fledged authoring system. However, scant documentation will be available. Users who are Hypercard savvy will be able to switch to the scripting level and create new stacks. Claris will soon have a version of Hypercard 2.0 that will include more complete documentation and guaranteed technical support. Claris has yet to determine exact availability and pricing.

Also due out today from Apple is System 6.0.7, which is intended to work with the Mac Classic, LC, and IIsi.

— Kristi Coale

Autodesk to Ship Autocad Update

Autodesk Inc. of Sausalito, California, announced it is updating Autocad for the first time since October 1988. The $3,500 Release 11 of the CAD package, which will work on PCs with a 80286 or higher processor, should ship before November 1. New features include the Autocad Development System and a programing language used to connect Autocad to other applications. Release 11 will also have network support, including file locking and node access functions.

— Paul Worthington

Tektronix to Sell Off Workstation Line

Tektronix Inc. announced late last week that it is pulling out of the workstation business and is seeking a buyer for its existing line of XD88 systems. The company will seek a buyer over the next 60 days; if it does not find one, it will simply discontinue the operation. The move affects only the XD88 line and not Tektronix's line of X Window graphics terminals and Net Stations.

— Martin Marshall

Fibronics Announces FDDI Server

Fiber-optic pioneer Fibronics last week announced the FX8610 workstation communications server, which includes special circuitry and software, and connects to the workstation's RJ-45 10Base-T Ethernet port. The server can boost data throughput between workstations or between a workstation and an FDDI network up to 100 megabits per second, according to the Hyannis, Massachusetts-based company. Pricing ranges from $20,000 to $30,000 for a unit supporting up to 12 connections.

— Barbara Darrow

Phoenix Unveils Small System Board

Phoenix Technologies Ltd. last week announced a system board design that allows manufacturers to more quickly gain entry to the notebook-size computer market. The board design — codeveloped with Intel Corp. — supports the 8.3-by-10.8-inch form factor and is based on Intel's 80386SX chip and 82340 core logic chip set.

— Ed Scannell

INFO WORLD

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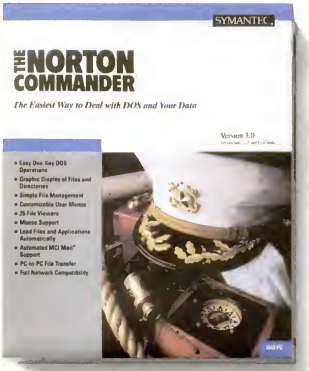
PRODUCT COMPARISON. The *InfoWorld* Test Center evaluates the latest in optical character recognition software for the PC.

REVIEWS. Palindrome's Network Archivist backup system; Letter Perfect, word processor; Tandy's low-cost 1500HD laptop.

PERSPECTIVES. The class action suit brought against Epson America has broad implications for the privacy of electronic communications.

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Your wish is our Commander.



In your wildest dreams, if you could do absolutely anything you wanted with your data files, what would you do?

You'd want to organize them, of course.

Manage them, too.

From time to time you'd probably need to look for them.



But most of the time, you'd just want to look *at* them—or through them—instantly.

Occasionally you might even want to send them to someone else so they could look at them, too.

Or transfer them to your laptop so you could play with them at home. Or away from home.

Naturally, you'd want to be able to do all of these things without having to do much of anything yourself.

Maybe pull down a menu, hit a couple of keys or nudge your mouse every so often.

Seeing is relieving.

Well, stop dreaming. Because the new Norton Commander® has arrived and it's better than anything else you can use to deal deftly with DOS.

In fact, the new Norton Commander is so good, it's even better than the old Norton Commander.

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They called Version 2.0 "a near-perfect DOS shell…the market's best…recommended for all DOS users, regardless of expertise."

We can't wait to see what the critics will say about our latest version.

And neither should you.

Now you see it.
Now you don't have to.

The new Norton Commander combines all the functions of a hard disk manager with all the features you need to support and enhance the DOS command line.

Yet it's flexible enough to adjust totally to your particular style of working—even get out of your way entirely when you don't need to see it.

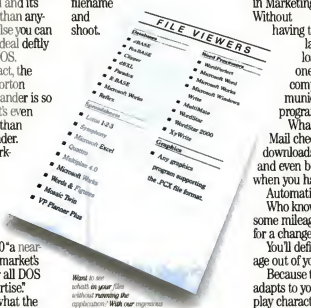
Near-Perfect DOS shell Emerges as Market's Best

InfoWorld thought the world of Version 2.0. The new Norton Commander is even better—and even easier to learn and use.

But since it can do so many things for you, you'll probably be seeing a lot of it.

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Automatically, of course.

Who knows, you may actually get some mileage out of your modem for a change.

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Because the Norton Commander adapts to your laptop's LCD display characteristics.

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Intel to Introduce 20-MHz Chip Set

Power Management Features Built Into Integrated Microprocessor

BY NICO KROHN

Following months of speculation about Intel Corp.'s research in highly integrated chips for notebook-size computers, the company will announce today its 386SX-based PC-on-two-chips solution.

Unlike other highly integrated chips, Intel's 20 MHz chip set includes power management features built into the microprocessor. The chip set draws between 4 and 12½ watts of power and increases battery life by up to 50 percent, said an Intel spokesman.

"It is 100 percent power aware. Every piece of logic can be powered down," said Mike Aymar, vice president and general manager of Intel's Santa Clara, California, division. OEMs and BIOS developers will have to create software to enable the power management features, a company spokesman said.

Conflicts caused by operating systems such as Windows 3.0 and traditional power management systems competing for memory, interrupt, and I/O



Intel's 386SL solution couples high integration with sophisticated power management techniques.

address space often rendered power management software ineffective in the past, Aymar said.

"We've added a new operating mode to the CPU that creates a whole new memory, interrupt, and I/O space that is transparent to all other real, protected, and extended modes," Aymar said.

The two-chip set consists of a 386SL microprocessor and an 82360SL peripheral subsystem. Together they make it possible to build a 4-by-6-inch PC motherboard with as few as seven components, said a company spokesman. Aymar said two notebook-size computer manufacturers have developed working prototypes using Intel's new chip set, which is expected to be available in early 1991.

Coming on the heels of Sunnyvale, California-based Advanced Micro Devices' release two weeks ago of a 286-based PC on a chip, the microprocessor giant's chips may pose a threat to competitors' products, said Michael Slater, editor and publisher of Sebastopol, California-based *Microprocessor Report*.

"This is a very important trend that will create a lot of concern among chip set vendors," Slater said.

"We haven't quite put the PC on a chip yet, but this is halfway there," Aymar said, adding that the 386SL, and the companion 82360SL, are the first in a series of highly integrated chips Intel plans to release. Later chips will include VGA graphics control.

The chips will be priced in quantity at $176 for the 386SL and $45 for the 82360SL. That should result in an end-user cost of $100 more than current 386SX laptop systems.

How Campuses Acquire New Technology

- Acquire equipment through ongoing budget process: **16%**
- Acquire equipment through one-time purchases, though moving toward a budget model: **33%**
- Acquire equipment through one-time purchases: **51%**

SOURCE: 1990 EDUCOM/UBC NATIONAL SURVEY OF DESKTOP COMPUTING

Eighty-four percent of U.S. college campuses currently have no routine budget mechanism for acquiring new technology.

Funding PC Purchases Is Low Priority on Campus

BY LAURIE FLYNN

A recent study reveals that relatively few U.S. colleges and universities have routine budget procedures in place for acquiring new PC technology, leaving the bulk of equipment acquisition to be performed during one-time special purchases.

Only 16 percent of surveyed campuses reported that they have a budget mechanism in place for acquiring and retiring PC equipment on a regular basis, according to the 1990 Educom/University of Southern California National Survey of Desktop Computing, which will be released this week at the annual Educom Conference in Atlanta.

Another 33 percent said they are moving toward such a budgetary model, but that they currently purchase equipment on a one-time basis. The remaining 51 percent said they have no plans to move toward a regular budget mechanism.

"Most nonprofit institutions, and particularly education institutions, just don't plan for the half-life of equipment," said Kenneth C. Green, senior research associate at USC's Center for Scholarly Technology, who directed the study.

What this means, said Green, is that campuses are more likely to continue using obsolete equipment, continuously passing it down to less sophisticated users.

The study also points out that student ownership of PCs offsets an institution's need to provide computing resources. Though student ownership of PCs varies greatly among types of institutions, ranging from 14 to 29 percent, the ratio of students to PCs is fairly consistent across institutions: about 45 students per machine.

Other results showed that about two-thirds of responding campuses have resale agreements with PC manufacturers, though only 40 percent have such agreements with software manufacturers.

PC resale agreements range from 91 percent of private institutions to only 39 percent of community colleges.

IBM Endorses MCA Group to Disseminate Information

BY BARBARA DARROW

NEW YORK — A group of Micro Channel Architecture (MCA) product developers who have been meeting informally to discuss compatibility and other issues have had their union formalized last week with IBM's blessing and participation.

"The Micro Channel Developers Association's charter is to establish an independent organization — and I stress that it will be independent of IBM — to facilitate evolution of MCA and ensure timely release of MCA-compatible products," explained Gordon Campbell, chief executive officer of Chips & Technologies, in San Jose, California.

As expected, the new group was formed to encourage developers to share information about the Micro Channel Architecture. (See "Developers Join Forces to Promote MCA Design," October 8, Page 1.)

"We wanted a mechanism within the industry to govern issues such as compatibility, technology disclosure, etc. IBM was approached last year by some of these vendors and was very receptive," Campbell said.

A primary aim is to facilitate dialogue between IBM and outside developers, ensuring that third parties have fast and equal access to technological information, noted Brian Vesley, president of Aox Corp., in Waltham, Massachusetts. The group also will act as a feedback mechanism to IBM itself, according to Vesley.

After a slow ramp-up following MCA's 1987 debut there has been a ground swell of development activity, Campbell said. Currently, 930 companies are developing for the bus structure — up from 700 last year, according to Robert Carberry, vice president of IBM's entry systems division.

Carberry also defended the articulation of IBM's bus strategy. "People wanted a road map [for MCA] and we outlined it last September. From the PS/2 to the RISC line to the low end of the 370 line — we've executed straight and narrow on that road map," he said. More than half of the PS/2 line now uses this bus, Carberry added.

The group was motivated by perceived compatibility problems among MCA devices, analysts said. This is a user protection mechanism, said Marty Alpert, president of Cumulus Corp. "We need to make sure peripherals will work with a broad range of MCA PCs."

Despite the group's self-proclaimed mandate, IBM itself will retain control of the bus



Chips & Technologies' Gordon Campbell said the MCDA will be completely independent.

specification, with the National Software Testing Laboratory and other organizations looking into certification issues. "Our goal is to facilitate the process, not be judge and jury," Campbell said.

Membership will cost $2,500 annually, with the first meeting slated for Comdex in November. The group comprises membership, process, and technical committees.

The 14 charter members are Aox Corp., Apricot Computers Ltd., Chips & Technologies, Core International, Cumulus Corp., Intel Corp., NCR Corp., NEC Technologies Inc., Olivetti Corp., NSTL, Reply Corp., Siemens Nixdorf, Western Digital Corp., and IBM itself.

Third-Parties Support Saros System With Links to Popular Word Processors

BY STUART J. JOHNSTON

Saros Corp. last week announced two third-party packages that let Word Perfect and Microsoft Word for Windows users store, catalog, and retrieve documents on multiple network servers.

Harris & Paulson Inc. of Englewood, Colorado, said it is shipping Request, which provides support for Word Perfect 5.0 and 5.1 files. Gilbert & Associates of Pacific Palisades, California, said its Viewz program provides similar support for Word for Windows documents.

Both products are built around Saros' Mezzanine file management engine, a SQL Server-based system that handles files on network servers.

In Viewz, Word for Windows is defined as the user's "home" application, and all file management capabilities can be accessed directly from within Word, according to Gilbert & Associates. A spreadsheet home application will ship in December, the company said.

The server portion for each copy of Request and Viewz costs $1,950. Request costs $395 per client and Viewz costs $345 per client. Customers who purchase Viewz in 1990 will receive a $100 discount on the workstation software.

Personal information management and electronic mail client applications are also under development, according to Gilbert & Associates.

Software Council to Promote Honest Business Practices

By Ed Scannell

BOSTON — A collection of 17 companies last week formed an organization to recommend marketing and financial practices for publishers, hoping to improve the software industry's reputation.

Executives from the newly formed Software Business Practices Council said the widespread existence of vaporware, false advertising, skewed benchmarking, and questionable accounting methods have seriously tarnished the industry's image.

"The credibility of the software industry is the subject of debate among customers and analysts, and that is something we can't forfeit," said Jeffrey Papows, chairman of Cognos Corp. and a council director. "Customers are concerned to the point where they don't know what to buy any more," he said.

The Council issued recommendations on marketing and benchmarking practices, and guidelines for recognizing revenues. Recommendations are based on independent groups' existing policies for marketing, accounting, and benchmarking. However, the Council's white paper did not include a policing mechanism for enforcing good behavior.

The Council received support from Lotus Development Corp., Ashton-Tate Corp., and Sybase Inc., among other PC publishers. Digital Equipment Corp. and Hewlett-Packard Co. are also founding members, as well as Price Waterhouse Inc., a major end-user organization.

Conspicuous by their absence were IBM, Microsoft, and Oracle Systems, the latter being cited by some industry observers as one of the reasons for the Council's formation. Recently, Oracle had to restate one year's worth of financial results because it counted revenues from sales before they were completed.

IBM and Microsoft are considered key to the Council's success. Papows said both IBM and Microsoft are considering whether to join, and Microsoft has assigned a vice president to meet with the Council.

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Rhapsody Delayed, Unbundles Work Flow Automation Features

By David Coursey

Rhapsody has given AT&T Computer Systems' executives something to fret about, with delays pushing release of the networked office automation package past the third quarter and into the fourth.

At the same time, AT&T is effectively unbundling Rhapsody's work flow automation features and will make them available to customers on a when-needed basis.

AT&T is pushing shipment to October 26. Bill Nelson, marketing manager in charge of the product, blamed the delay on late-arriving versions of Microsoft Windows 3.0 and Hewlett-Packard New Wave used in Rhapsody. In addition, beta users demanded late changes, according to Nelson.

Announced March 27, Rhapsody is office automation with a twist. Work flow automation features allow documents and other tasks to route themselves from one user to the next, providing better coordination of group projects, Nelson said. After AT&T's announcement, IBM said work flow features will be added to its Office Vision package.

"The work flow system was not originally designed for Windows," said Ann Palermo, director of office systems research at International Data Corp., a Framingham, Massachusetts, consulting firm. "AT&T was having some look and feel issues."

User comments have also affected how AT&T will sell Rhapsody. Two versions will be offered, one lacking the 200 to 300 megabytes of development tools used to create work flow automation applications, Nelson said. This will give users the option of a two-stage implementation, allowing them to learn the Rhapsody object-oriented desktop environment without having to master work flow applications at the same time.

"AT&T really made a statement by including work flow automation as a standard part of the environment," IDC's Palermo said. "They may have been a touch ahead of where the users are."

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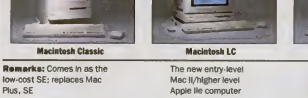
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Remarks:	Comes in as the low-cost SE; replaces Mac Plus, SE	The new entry-level Mac II/higher level Apple IIe computer	Seen as one-slot, entry-level 030 modular system; can it replace the IIcx?
Processor:	68000, 7.8336 MHz	68020, 16 MHz	68030, 20 MHz, built-in PMMU
Video:	Monochrome, 9-inch screen	8-bit color on-board, choice of three monitors	8-bit color on-board, works with all Apple monitors
Sound:	Output only	Input/output	Input/output
RAM:	2MB on-board, expandable to 4MB	2MB on-board, expandable to 10MB	1MB on-board, expandable to 17MB
Expansion:	None	020 Direct Slot	Either Nubus or 030 Direct Slot; adapter must be purchased separately
Storage:	optional 40MB internal hard disk	40MB internal hard disk drive	40MB or 80MB internal hard disk drive
Price:	For 2MB RAM/40MB hard disk: $1,499	For 2MB RAM/40MB hard disk: $2,499	For 2MB RAM/40MB hard disk: $3,769
Availability:	Now	January	Now

SOURCE: APPLE COMPUTER INC.

Macs

Continued From Page 1

adapter boards, and a 512K VRAM SIMM. All three monitors work with the LC and the IIsi, and sell for $299, $599, and $999, respectively.

Apple's sound input system lets users annotate documents such as spreadsheets with sound. Already, Microsoft, CE Software, and Farallon have developed applications to take advantage of this capability. (See related story, Page 44.)

This announcement also marks the departure of three other Macs — the Plus, the SE, and the IIcx. Industry observers have expected Apple to discontinue the Plus and SE for some time, and it became apparent during the summer that the IIcx was being phased out.

Apple is positioning the Classic as a lower cost SE; the IIsi will serve as the low end for the Macintosh II family of computers.

The LC, the only machine not shipping today, is generally viewed as the Macintosh that will replace the Apple II line and wean away Apple users from the IIe. This machine comes with an Apple IIe emulator that lets users run almost all applications developed for Apple IIe machines.

Apple may be breathing a sigh of relief because many of its developers have renewed their interest in the Mac, after considering development opportunities for Windows. Developers now seem very excited about the potential market opportunities offered by the new machines. "There's not been a Mac available to make us a viable business until now," said Heidi Roizen, president of T/Maker.

Also enthusiastic, resellers feel this introduction does more to dispel previous perceptions of the company than it does to make Macs more competitive with PCs. "Apple's price level [for the new machines] changes the perception of Apple as a greedy company," said M. Dendy Young, president and CEO of Falcon Microsystems.

Although bullish on the IIsi, Young also feels that it is somewhat pricey.

Apple has come to an important realization with these machines — that not all potential Mac users want or need all they've been offered in the past, said Seymour Merrin, president of Merrin Information Services. "Not all classes of customers want the same product."

Macs Make Innovations On Price, Not Technology

BY KRISTI COALE AND TOM QUINLAN

For users who associate Apple Computer Inc. with breakthrough technologies, the three Macintosh models introduced yesterday may be something of a disappointment.

The new Macs represent a repackaging of existing features, with most innovation focused on design and manufacturing efficiencies that allow them to be sold at lower prices.

With a $1,000 Mac Classic replacing the Plus and the SE, an LC providing lower cost color, and the IIsi replacing the popular IIcx as the entry-level 68030 modular system, those low price points have received praise for adding excitement into a depressed market.

"In a slow market, I'm always going to be enthusiastic about new products," said Mark Wozniak, vice president of marketing for Computer Plus/ERA Computers. "But the one thing I'm disappointed about is that there isn't a lot of new enabling technologies."

The single significant new function, included in the LC and IIsi, is sound input capability.

"These new machines won't blow the doors off anything," said Steve Costa, executive director of the Berkeley Macintosh Users Group, who also felt that the machines would sell well.

Mike Bailey, systems integrator for Locutel, in Sunnyvale, California, concurs with Costa but added that this will not be an issue for the new users Apple is trying to reach.

Still, some maintain that the Intel-based PC offerings that run Windows are a better value than what Apple may offer at the same level with a Motorola-based architecture.

A 68020-based system still isn't as powerful as a similarly equipped 80386-based system, which will cost less then the Macintosh LC, said M. Dendy Young, president and CEO for Falcon Microsystems. Still, that doesn't mean Apple's new products won't be successful, Young said.

Hardware aside, Young feels Apple's new pricing could open the market for the Macintosh because its operating system is still head and shoulders above anything in the DOS world, including Windows.

Fox

Continued From Page 1

reality," said Menachem Bazian, consultant to a major New York commercial bank. Bazian said the new Fox data access technologies shown last week, which Fox has named Rushmore, are the first to make "downsizing" of mainframe applications to PCs feasible.

Rushmore speeds up both record-oriented and set-oriented operations in Foxpro 2.0. Thus, even SQL users will benefit, due to Foxpro 2.0's support of SQL select commands, according to Fox president David Fulton. But the speedup is most dramatic on classic Dbase applications — record-oriented operations in files so large that until recently PCs could not store them on hard disks.

Because of Foxpro 2.0's text-merge and memo field features, Rushmore will also revolutionize text management on PCs, according to Fox. Relatively, a developer at YMCA's national headquarters, in Rosemont, Illinois. "With a 33-MHz 386 or 486 PC, a 650-megabyte hard disk, and Foxpro 2.0, there's nothing we can't do to deal with that data," Snively said.

Live demonstrations of Rushmore overshadowed other Foxpro 2.0 features last week. A Rushmore database server is, in fact, on Fox's back burner until the company can ship Rushmore-based Foxpro 2.0 in the first quarter of 1991. Foxpro/Mac is expected to ship shortly thereafter. Important features such as transaction processing must also be added to Foxpro to transform it into a database server.

Foxpro 2.0's integrated screen and menu generators, as well as a template language, are attractive to many developers. The inclusion of an application programming interface makes Fox the first DBMS vendor to offer third-party libraries that can access Fox executable, runtime, or interactive applications. This has been a well-received addition.

SQL and query-by-example features will also help to broaden Foxpro's appeal to MIS and users, developers said.

To broaden Foxpro's appeal, a data dictionary must be added, according to developer Adam Green. Fox may be reluctant to invent one before Dbase market leader Ashton-Tate does, particularly while that company's lawsuit against Fox is still pending.

Other major enhancements will include hypertext help, a way to specify which records are being browsed, compound indexes, and an extended mode using the 386 and 486 protected mode. Pricing has not yet been determined.

Apple Puts Finishing Touches on Mac Portable II

BY TOM QUINLAN

Apple Computer Inc. is expected to introduce a lighter, more powerful version of its much-maligned Macintosh Portable in time for the January Macworld show, although sources familiar with the system complain that the Macintosh Portable II remains too heavy and too expensive.

The new system will incorporate a 68030 microprocessor, a backlit LCD screen for easier readability, and design changes — including a lighter battery pack — that will reduce the weight of the system to between 11 and 13 pounds. The current Mac Portable weighs 16 pounds.

The Macintosh Portable II will have a list price only slightly higher than the $7,000 price tag for the current machine and will maintain the current 15-by-15-by-4-inch dimensions, sources added.

Apple is debating on whether it should continue to offer the original Macintosh Portable, and is considering reducing the price, sources said.

How soon Apple can design a true notebook portable will also be a factor in how to position the Portable II. Apple's top executives John Sculley and Michael Spindler recently admitted that such miniaturization was beyond Apple's present capability.

While Apple has recently entered into highly publicized discussions with Japanese companies Sony Corp. and Toshiba Corp. to develop and manufacture such a Macintosh, these talks are still in the preliminary stages, with no firm agreements or product designs expected in the near term.

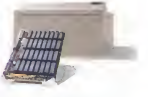
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SOFTWARE

Q&A

Fox Plans a Windows 3.0 Version of Dbase Products

Fox President David Fulton Discusses Goals

By Scott Mace

Fox Software President David Fulton is no stranger to the accolades of Dbase users or to controversy. While Dbase IV languished, Fox thrived, leading to Ashton-Tate's pending look-and-feel suit. Now Fulton delivers on his promises of a faster, easier-to-use, record-oriented server in Foxpro 2.0's Rushmore technology. Fulton spoke to InfoWorld's Scott Mace at last week's Fox Software Developer Conference in Toledo, Ohio, near Fox's Perrysburg offices.

IW: Does having three separate Dbase products [Dbase IV, Foxpro, Clipper] pose some sort of challenge to Fox, in that the products are no longer just work-alikes?

Fulton: Nantucket seems to be moving toward being a language company. I don't know what Ashton-Tate's technical focus is. Our orientation, I guess, is as a database company.

IW: In Foxpro 2.0, what kinds of set operations are not optimizable, and how much of a detriment will that be to users?

Fulton: Well, not much. The only things that are not optimizable at present, and that may be changed, are things like expressions involving fields. For most common kinds of retrieval criteria, which almost always involve comparisons with field values, it works just fine.

IW: Are you looking at Windows?

Fulton: Yes. Our real agenda for next year, once we get Foxpro 2.0 and Foxpro/Mac out, is a Windows 3.0 version, which will probably be protected mode only, so it can be fast. I'm quite sure we'll do a server.

IW: What connectivity will there be between Foxpro and other data servers?

Fulton: Connectivity issues are now solved with the API.

IW: But people want finished products, as well as an API.

Fulton: I understand. Most major network vendors are working with us to provide libraries to their particular products, to be available roughly the time Foxpro 2.0 is.



Fox's Dave Fulton pushes the Dbase language with Foxpro.

IW: You've said unkind things about SQL gurus, and vice versa.

Fulton: I don't think they're going to like me any more because we've adopted some of the SQL syntax. We're certainly not really abiding by the rules. My thrust is an approach to our existing user base. There are more practical people who are more interested in making their stuff work better and faster, and taking advantage of some of the new technology, than people interested in following rules to be following rules.

IW: The SQL gurus have really held the PC database market hostage for more than two years.

Fulton: This will crack it open, and I hope demystify SQL to some extent. Taking the cream and leaving the skim milk behind is not a bad approach, necessarily. □

Businesses Exploring CD ROM Publishing

Space, Time, Money Savings Are Key Issues

By Nico Krohn



Attempting to beat rising printing costs, an increasing number of corporations are turning to CD ROM publishing and moving thousands of pages of data to a few polycarbonate discs.

Many firms making forays into CD ROM publishing are seeking a cost-effective way to distribute large amounts of data to branch offices, said users who responded to an *InfoWorld* input request. For them, the $50,000 price tag of some authoring packages is worth it.

Two years ago, executives at Ford New Holland Inc., a New Holland, Pennsylvania, producer of farm equipment, decided to switch from publishing its parts catalogs on paper to CD ROM. They bought Cambridge, Massachusetts-based Dataware Technologies Inc.'s $30,000 CD Author indexing software and moved 400 megabytes of data from three mainframe systems to a single CD, compressing it to 100 megabytes in the process.

"I didn't know what indexing meant when I started this," said Carmen Martin, who did the indexing. "I'm not a programmer. I'd used Visicalc and Wordstar before this project."

"Dataware's software is pretty expensive, compared to some others," Martin said. "But it's really easy to use. We probably could have gotten away with a lesser package — we're not using all its capabilities."

Whereas Ford New Holland's data was easily converted into clean ASCII files, others found the conversion to be time consuming.

The Electric Power Research Institute (EPRI) of Palo Alto, California, took more than a month to convert technical report data to clean ASCII format, index it, and distribute it on CD ROM discs to utility companies across the United States.

The disc contained 20 databases, some text-based and some bit-mapped black-and-white graphics, slides, audiovisual presentations, and applications.

"Linking illustration image files with the text was difficult," said Mary Anne McGill, an EPRI information specialist. "But once we had the data in the right format, it was really fast."

EPRI used Mountain View, California-based Knowledge Access International's Kaware, a $795 package, to index data. "I know you're paying a lot more for some of these (indexing) packages, so you'd hope it's a lot easier with them," McGill said.

Uncertainty about how long it takes to prepare data causes some firms to hesitate before sinking time and money into CD ROM publishing.

"I'm reading some horror stories where products fall on their faces, after a lot of money has been put into it," said Mark Margevicius, a consultant for Cleveland, Ohio-based Society Bank, which is considering CD ROM distribution of systems documentation. But CD ROM is sometimes the only viable solution for distributing data.

"Not a lot of companies have done it, but to me CD ROM is the only way to distribute the sheer volume of information," Margevicius said. □

XDB Introduces Windows-SQL Interface Toolkit

By Scott Mace

XDB Systems last week demonstrated its XDB-Windows Software Developer Toolkit, consisting of its SQL engine running as a Windows 3.0 task, a Windows client redirector for the XDB Server, and a C programmer's interface.

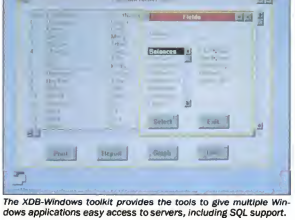
Scheduled for fourth-quarter release, the XDB-Windows toolkit includes both embedded SQL and a C applications programming interface (API). XDB's client/server approach gives access to the SQL engine to any number of Windows tasks.

XDB's emulation of IBM's DB2 makes it easy for corporate programmers to adapt to Windows, said Rich Bernstein, a systems developer with Future Expansion Inc., which is building a Windows application to tie together diverse transportation costs and billings.

XDB also introduced its Common Windowing Interface (CWI), a high-level interface between applications written in C and graphical user interfaces. The CWI lets C programmers write applications once and substitute GUI drivers for different environments, including Windows 3.0, Presentation Manager, X Window, and Macintosh.

"XDB's CWI even emulates a windowing interface in DOS and OS/2 text mode," said Kim Ball, XDB's product manager. The result is a consistent appearance across platforms. The XDB-Windows toolkit, including CWI, costs $750.

XDB Systems Inc., 7309 Baltimore Ave., Suite 219, College Park, MD 20740; (301) 779-6030.



The XDB-Windows toolkit provides the tools to give multiple Windows applications easy access to servers, including SQL support.

Microrim Delivers Delayed Rbase 3.1 With Expanded Memory Support

The delayed Rbase 3.1, which adds the capability to read and write Dbase III and III Plus files, is shipping from Microrim Inc.

The company is targeting users of other database systems by offering the single-user version of 3.1 through this year for $195 plus proof of purchase of the other product, said Scott Fallon, Rbase product marketing manager.

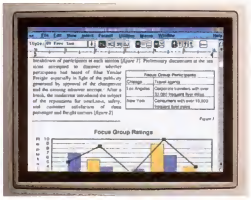
Rbase 3.1 shipped about six weeks later than scheduled because Microrim added expanded and extended memory support, and did extra testing.

The single-user DOS-based Rbase 3.1 costs $795, and the five-user LAN version costs $995. Pricing has not been set for run-time versions of 3.1, which are scheduled to ship this year, but 3.0 run times cost $125 for five users, Fallon said. Microrim is also not projecting availability of a 3.1 version of the Rbase Compiler.

Microrim Inc., 3925 159th Ave. N.E., Redmond, WA 98052; (206) 885-2000.

— *Stuart J. Johnston*

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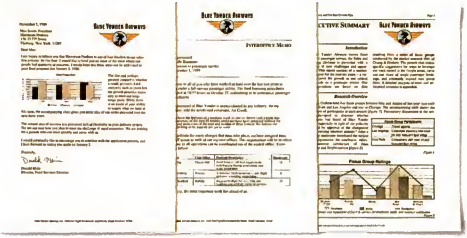
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NCR Debuts in Office Automation Arena

By Barbara Darrow

NEW YORK — NCR Corp. last week unveiled its much-anticipated foray into office automation software with Cooperation, a slew of integratable modules from NCR and third parties. Cooperation is part of NCR's Open Cooperative Computing Architecture (OCCA) office automation strategy.

The offering incorporates core client- and server-resident pieces as well as 50-odd application modules that can be mixed and matched as needed, said John Cray, assistant vice president of NCR's cooperative computing systems division.

The hardware component, NCR's System 3000 family of Intel-based machines ranging from standard desktop PCs to mainframe-class machines, was announced two weeks ago. The final shoe will drop next week when NCR outlines its networking strategy, most likely including plans for a rearchitectured Portable Netware for the Intel architecture.

Like Hewlett-Packard's New Wave Office and Data General's CEO Object Office, Cooperation is built atop HP's object-oriented New Wave environment. The central desktop component is NCR Desktop, which includes Windows 3.0, New Wave 3.0, computer-based training, security features, and bridges to 31 DOS software packages. This bundle will list for $410. For users who already have Windows, a version is available for $260.

The server components, including LAN Manager, file, print, and directory services, framework libraries, and a system management package, costs $2,700 for five users.

Other modules expedite remote application access via VT and 3270 terminal emulation and include communication authoring tool. Server-resident links to DB2, SQL Server, Oracle, and SQL-Base databases were also announced.

The Information Storage Manager, an OEM version of Saros Corp.'s Mezzanine file management system, enables a network user to retrieve a file without knowing its name or location. This module will retail for $210. The Business Information Manager module, an OEM version of Channel Computing's Forest & Trees executive information system, will cost $595.

Analysts lauded the scope of the announcements but said Cooperation's fate will be determined by NCR's marketing strategy. The products are currently sold direct or through VARs and ISVs, and there are no plans to sell the modules via retail outlets, according to Clark.

It was also unclear how this entry will stack up against other offerings such as HP's New Wave Office, Data General's CEO Object Office, AT&T's Rhapsody, and IBM's Office Vision.

Comparisons between these products are difficult because so few of them are actually installed and working, said Anne Palermo, analyst with International Data Corp., in Framingham, Massachusetts. NCR clearly has a way to go to break into the top tier of suppliers, she said.

Preconfigured systems for 12 users cost $23,000 to $37,000, or about $1,900 to $3,100 per seat. A 24-user block ranges from $40,000 to $58,000, or $1,700 to $2,500 per user. NCR's Gray estimated that a 386 server will support 16 active clients while a 486 increases that up to 24 or 48 active users.

Limited availability of OS/2 server/DOS client implementations is scheduled for November, general availability is slated for March 1991. Unix server/DOS client implementations will start to ship in June, with volume availability slated for August.

USER INPUT

In announcing Cooperation, NCR joins HP, Data General, and others in offering PC-based office automation products. But are these systemwide solutions built on single operating environments, in this case New Wave, what PC managers want? If you are involved in acquisition or management of such systems and have an opinion or experience to share, we'd like to hear from you. Please contact senior writer Barbara Darrow at (800) 344-4636, Ext. 567.



Knowledge Seeker applies user-guided expert system technology.

Knowledge Seeker 2.0 Supports Mouse, Simplifies Data Import

By Scott Mace

A decision-support program that reads and analyzes data from a variety of database management systems (DBMSes) now features simpler data importing, mouse support, and more speed.

Knowledge Seeker can recommend a number of possible decision options, said officials at First Mark Technologies of Ottawa, Ontario. The program incorporates expert system technology but allows user-guided searches of data, officials said.

Knowledge Seeker 2.0 adds import-format files, which let users develop standard formats for repetitive importing. Users can now predefine field names for Dbase, Paradox, Lotus 1-2-3, Microsoft Excel, and tabular and delimited ASCII import files.

Users can preselect dependent and independent variables for the analysis after the import is complete, and exclude fields from the import operation, thereby reducing import time, said FHS International Inc., the program's U.S. distributor.

Also new are menu, decision tree, and screen-motion interfaces; dialog boxes with preset options and prompts; a batch processing interface that can apply previously defined work to new data; menu-driven data, data description, and analysis view editor; and isolated tuning options for the statistical expert.

The $495 Knowledge Seeker 2.0, now shipping, runs on PC XT compatibles with 640K of RAM and a hard disk.

FHS International Inc., 8260 Greensboro Drive, Suite A20, McLean, VA 22102; (703) 847-0572.

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Let's face it, the better your faxes look, the more likely they'll be noticed on the other end. That's why Communiqué produces eye-catching faxes like the one on the left. Take a look. Communiqué also gives you a Graphic User Interface with icons and buttons so you don't have to mess around with complicated DOS commands.

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Communiqué requirements: IBM PC or compatible with 640k, hard disk, graphic card (color or monochrome), MS-DOS 3.0 or higher, and a mouse.

The Fax9600 board is a half-slot board for IBM PCs and compatibles.

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The Communique software has a graphic user interface based on easy-to-understand icons and buttons everyone at the office keeps dropping by my desk just to see it! Let a get together sometime and I'll show it to you.

Best Regards,

Tina Berman

Tina Berman
Golden Section

a sample of fax options using Communique fax software

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PRODUCT PIPELINE

● WORD PROCESSING

IBM MOVES COMPOSER TO DOS. IBM is now shipping a page layout program to complement its Displaywrite 5 word processor. Displaywrite 5 Composer includes 50 predefined style sheets and is a DOS version of an earlier OS/2 product from IBM. The $595 package includes Displaywrite 5; owners of that program can obtain the page layout program for $125. (800) IBM-7699.

WORD UPDATE DUE. Microsoft Corp. officials have confirmed that a new version of Word will be out by the beginning of November. Word 5.5 will be officially announced either late this month or early November, said Blas Garcia, lead product manager for Word for DOS. Other Microsoft sources said it will ship by fall Comdex, which is also when an OS/2 version is due out. (206) 882-8080.

PARSONS ANNOUNCES WRITER'S REFERENCE. The RAM-resident Writer's Reference from Parsons Technology runs with most word processors to improve users' writing. The $59 program contains such pop-up topics as organizing ideas and grammar guides, as well as business correspondence templates. (319) 395-9626.

● DATABASES

WORDTECH DELAYS ARAGO RELEASE. Wordtech Systems Inc. is delaying release of its Arago Dbxl interpreter and Arago Quicksilver compiler from November until early 1991, citing delays in launching beta testing. (415) 254-0900.

CLIPPER TOOLS SHIP. Valkyrie, a source code recovery system for Clipper developers, is now shipping from Programming Solutions Inc. The utility works with Clipper 87 files and can produce a series of PRG files containing Clipper source code. Valkyrie costs $995, but will be available at a $495 introductory price through this month. (801) 262-4141.

● SPREADSHEETS

MICLOL SHIPS 1-2-3 PRESENTATION UTILITY. The RAM-resident Grace for Lotus 1-2-3 provides screen-capture functions and tools for users to build a presentation database with data from 1-2-3, Releases 1.X or 2.X. Users can embed presentations within a cell and click on that cell to activate the show, according to the developer, Miclol Corp. The program costs $199 but is available for the introductory price of $39 through November. (800) 283-4080, Ext. 881.

PRO QUBE LITE RELEASED. Formal Soft has released Pro Qube Lite, a scaled-down shareware version of its three-dimensional spreadsheet Pro Qube 3D. Pro Qube Lite replaces the shareware Qube Calc. It supports 3-D worksheets of up to 512 pages per file, file linking, import and export of 1-2-3 and Dbase files, a macro language and recorder, sorting on up to nine keys, @ functions, on-line help, and other features. Its $25 registration price can be applied to the purchase of Pro Qube 3D, which costs $99. (801) 565-0971.

Multifaceted Telecommunications Package Released by IDR Unicom

A versatile communications package that can send and receive telex and TWX messages, as well as fax and perform normal telecommunications, is now shipping from IDR Unicom Inc.

Via PC Telecommunications Software provides the tools for basic telecommunications tasks with a standard modem and is capable of sending and receiving fax, telex, and TWX transmissions.

Besides a standard dialing directory, recording tools, and variable settings, the package includes an extensive international database of national area and access codes. The user can prepare the transmissions, instead of requiring a special operator.

The program includes a text editor, but users can also prepare text in a separate word processor. The product makes use of two COM ports at once, allowing two simultaneous communications sessions. For example, one line can be used to receive telex and TWX messages while the operator uses the other line for telecommunications.

The single-user version of the product costs $595; network implementations are also available.

IDR Unicom Inc., 400 Stenton Ave., Plymouth Meeting, PA 19462; (215) 825-8181.

— Mark Brownstein

GREAT MOMENTS IN DATA PROCESSING



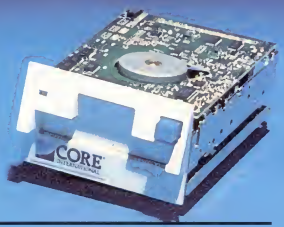
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HARDWARE

ALR CPU Modules Interchangeable in EISA, MCA PCs

BY MARK BROWNSTEIN

Advanced Logic Research Inc. announced last week a new upgradable Micro Channel-based system including CPU modules that are exchangeable with its EISA-based systems.

The Modular Processing System (MPS) features modular design, allowing the processor to be upgraded by swapping in an upgrade card. Processor cards and SIMM modules can be shared with the company's Business Veisa line of computers.

For companies planning to upgrade their systems, being able to purchase the same upgrade modules for both ALR's EISA and MCA systems may be an attractive option, according to Dave Kirkey, vice president of sales and marketing at ALR.

The base unit is built around an Intel 33-MHz 386DX processor. The system supports bus mastering, and includes a 16K cache in all 386-based units, except for the entry-level system. Versions using the 486 chip in either 25-MHz or 33-MHz speeds utilize the 8K cache that is built into the processor.

A total of four MCA 16-bit, two MCA 32-bit, and two proprietary ALR slots are included in all units. Video card and monitor are optional.



ALR's MPS 386/33 Model 101 with one megabyte of memory sells for $1,995.

Furthermore, all implementations include a standard IDE interface, a floppy controller that supports two devices, one serial and one parallel port, and a PS/2 mouse port. A PS/2-compatible keyboard port is also included.

The base system, ALR MPS 386/33 Model 101, with 1 megabyte of memory, no RAM cache, and no hard drive, lists for $1,995.

The systems will begin shipping next month, the company said.

Advanced Logic Research Inc., 9401 Jeronimo, Irvine, CA 92718; (714) 581-6770.

Low-Cost 386SX PC Ships With On-Board VGA, IDE Controllers

BY NICO KROHN

Cumulus Corp. is now shipping an upgradable 386SX-based computer complete with monochrome VGA monitor for $1,195.

The GLC/CO comes with 1 megabyte of RAM, a 3½-inch 1.44-megabyte floppy disk drive, a 101-key keyboard, a 16-bit VGA adapter and monitor, and a mouse.

Its passive backplane architecture allows users to easily upgrade to to an 80386DX or 80486 microprocessor.

Based on the ISA bus, the system offers two 16-bit full-length expansion slots, one 16-bit half-length slot, and one 8-bit half-length slot.

The basic configuration comes without a hard disk drive, but the system features an on-board drive controller that will handle up to two IDE hard disk drives and two floppy disk drives.

Options include expanding memory to 4 megabytes, or adding a 40-, 100-, or 200-megabyte hard disk drive.

Users can also add memory cache accelerator cards in 16K and 64K configurations, or an 80387 math coprocessor.

DOS 4.01, Windows 3.0, and Microsoft Works are bundled with GLC/CO.

Cumulus Corp., 23500 Mercantile Road, Cleveland, OH 44122; (216) 464-2211.



The GLC/CO 386SX-based desktop accepts 386DX or i486 CPU upgrade modules.

Compaq to Unveil 386SX Notebook

Company Gets the Jump on Fall Comdex Portable Announcements

BY BARBARA DARROW

NEW YORK — Hoping to steal some of the thunder from anticipated Comdex announcements, Compaq Computer Corp. today will introduce its first 386SX-based notebook computer.

Shipping this month, the LTE 386s/20, based on Intel's 386SX 20-MHz chip, has the same 8½-by-11-inch footprint as its predecessor the LTE 286, announced a year ago, but weighs more — 7½ pounds compared to 6.2 and 6.9 pounds for the LTE and the LTE286, respectively, according to Lorie Strong, Compaq's director of product marketing.

The design also incorporates Regal Flex technology developed by Teledyne Electro-Mechanisms for the aerospace industry. The technology enables the creation of circuit boards with both hard and flexible segments. Such boards can be folded up, packing more circuitry into less real estate thereby enabling Compaq to cut the number of connectors required, Strong said.

"The unit's Nicad battery has a three-hour life and can be quick-charged within the unit in 1½ hours," Strong said. "Batteries used in the older models require 12 hours to recharge."

Compaq has also duplicated the port structure of its desktop models so that business people can easily use the laptop with their office printers and other peripherals, Strong said.

A standard configuration with VGA graphics, 2 megabytes of RAM, and a 30-megabyte hard disk will retail for $6,499. A version with a 60-megabyte hard drive will sell for $6,999. One- and 4-megabyte RAM expansion cards are available for $549 and $2,199, respectively.

In line with its usual practice, Compaq will jump the flurry of Comdex introductions. Several vendors, including Dell, AST, and Epson, are expected to unleash their 386SX-based VGA offerings at the show.

Compaq Computer Corp., 20555 SH 249, Houston, TX 77070-2698; (713) 370-0670.



Compaq's LTE 386s/20 packs SX power, VGA graphics, plus a floppy and a 2½-inch hard drive in a 7½-pound package.

Accutrak 2320 Breaks New Ground

Large-Capacity Streaming Tape Drive Uses Minicartridge Format

BY MARK BROWNSTEIN

A new streaming tape backup drive by Irwin Magnetic Systems Inc. that scores a variety of firsts will begin shipping in volume early next year.

The Irwin Accutrak Model 2320 is the first in a series of high-capacity drives that use the standard minicartridge format, according to the company.

It is also the first streaming tape drive to use new 900-oersted tape, the company said. The new tape allows considerably higher recording densities than the current standard 550-oersted tape.

As a result of the improved media, higher track density and more recorded tracks can be placed onto a tape, the company said. A further result of the data density is higher performance in both reading and writing to the tape.

In addition to being the first streaming drive to use the new tape, the drive is also distinguished by a new gauge material with embedded stainless steel particles that is used to make the drive itself. The new material dissipates any static that may come in contact with the drive, reducing risk of data loss or damage to drive electronics after a static charge occurs, the company said.

The drive is also downward compatible with tapes made with other Irwin minicartridge drives. The drive features a SCSI-II interface.

An optional compression chip add-on can be installed in the drive, that can increase data transfer rates and tape capacity as much as three or more times, depending upon the type of files being stored. Logic built into the compression algorithm prevents compression where there would be no significant gains, or in files that have already been compressed, the company said.

Tapes may contain both compressed and full-size data files, and the drive is capable of determining the compression method used as well as correctly uncompressing the files.

For smaller capacity drives, Irwin Magnetics is now shipping a new version of its backup software, Eztape, Version 2.2, with a software version of the compression engine. Using the compression software, storage capacities can be increased by a factor similar to that used by the hardware module for the Accutrak 2320 drive, the company said.

In addition, the 2320 can read and decompress tapes recorded on drives using Eztape, Version 2.2.

Because of increased data density, recording and restore functions for compressed files are faster than for uncompressed files.

The Irwin 2320 will be available in the first quarter of 1991.

The 320-megabyte version of the drive will have a list price of $1,495, and the version with the compression module will sell for $1,795.

Eztape 2.2 is being shipped with current drives. Users of earlier versions of the software can upgrade to 2.2 for $49 through January 1, 1991, after which the price will increase to $149.

Irwin Magnetic Systems Inc., 2101 Commonwealth Blvd., Ann Arbor, MI 48105; (313) 930-9000; (800) 421-1879.

■ SPOTLIGHT



QMS Inc. has dropped the list price of its Colorscript 100 Model 10 color laser printer by $1,000, from $9,995 to $8,995. The Model 10, which supports legal-size printing, includes 5 megabytes of RAM, a 16-MHz Motorola 68020 internal controller, Adobe PostScript, and HPGL emulation, and features Macintosh spooling capabilities. The printer is now available. (800) 631-2692.

Multimedia Flash, Vendor Concern Dominate CD ROM Expo

By Barbara Darrow

BOSTON — Multimedia presentations incorporating flashy action video, digital sound, and computer-generated animation were the big stars at the CD ROM Expo held earlier this month. But some vendors were more concerned about the realities of moving multimedia into mainstream applications and hardware than in flash and sizzle.

Multimedia tools — including dynamic help screens and animated tutorials — could have big implications for business applications. For example, such features could help users learn and use their spreadsheets, according to Rob Lippincott, director of business development for Lotus Development Corp. "I'd love to see a video user interface — an extension of GUI that would have windows filled with video and dynamic, high-resolution icons — things like that would impart more information to the user," Lippincott said.

But before that can happen, affordable hardware that is up to the task needs to find its way into the user base.

The optimum equipment for such jobs would be a 386-based PC with VGA graphics and an internal CD ROM drive, according to Cornelius Willis, of Microsoft's multimedia systems and tools group.

"We'd like Windows to treat audio [and] video data as just another data type, but that extension is a ways off," Willis said.

Users should beware of the hype accompanying many multimedia demos, vendors cautioned, citing applications that look slick and interactive but require expensive hardware and sometimes incompatible components.

"Multimedia has been puffed so much that no one knows what's what anymore," said William M. Spaller, director of multimedia systems for IBM, in Somers, New York. Nonetheless, Spaller predicted that the market for multimedia products for platforms costing less than $15,000 will grow to $24 billion by 1994.

There are drawbacks to using older hardware — motion video is not accompanied with synchronized sound and is only displayed on one-quarter of the screen, for example. "This is PDI — poor man's disc interactive, because we want to sell into the installed base," said Brock Stanton, product manager with IBM's educational systems division, in Atlanta.

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Mountain Tape Drive Exploits IDE Interface For Faster Backups

By Mark Brownstein

A new streaming tape drive that uses a system's intelligent data electronics (IDE) interface was announced earlier this month by Mountain Network Solutions Inc.

Many of the streaming tape drives on the market today have been performance bound as a result of being tied to a system's floppy disk controller, which limits data transfers to 512 kilobits per second (kbps). Mountain's Filesafe 8500 using IDE can record up to 304 megabytes of data on a standard DC2120 minicartridge, the company said. It attaches to the system bus via the IDE connectors that are frequently integrated on new system motherboards, or that can be added — often for less than $100.

The drive can back up a hard disk at up to 10 megabytes per minute when operating in data-compression mode. Burst data transfer rates of 5½ megabytes per second can be achieved.

A 304-megabyte hard disk drive can be backed up onto a single cartridge in less than 30 minutes, the company said. The drive reads and writes standard QIC-80 and TD-101 tape formats.

A format-on-the-fly feature eliminates having to format tapes prior to use. The Mountain drive formats tape as needed.

End-to-end tape positioning takes less than 40 seconds, the company said. The Filesafe 8500 also has an average access time of 20 seconds.

The Filesafe 8500 will begin shipping to OEMs for evaluation in January 1991. Suggested retail price will be $895 when the drive becomes generally available in March.

Mountain Network Solutions Inc., 240 Hacienda Ave., Campbell, CA 95008; (408) 379 4300.

In designing the new 386SX notebook, Epson engineers had to weigh a lot of options.



KEYBOARD

As this actual size photograph shows, the NB3s has a large, comfortably sized keyboard.



STORAGE

The Epson NB3s comes with a 40 MB or a 20 MB Conner* hard disk drive, a standard 3.5 inch floppy drive, and an optional internal modem.

VGA

The large backlit, 640 x 480 resolution LCD screen includes 16 gray scales for sharp black-on-white VGA graphics.







386SX

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In a world where PC users demand uncompromised performance from a portable computer, Epson® introduces a 5.8 pound engineering breakthrough that dispels the notion that less weight means less computer.

The product is the new Epson NB3s. The performance is that of a 386™SX desktop, with up to 5 MB of RAM, a choice of a 40 MB or 20 MB hard drive, and VGA technology for sharp, legible graphics—all in an 8.4 x 11.8 x 1.7 inch computer.

That combination of power and portability makes the Epson NB3s the perfect computer for people who simply don't believe in compromise.



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To see how light a 386SX notebook can be, you'll have to pick up an Epson NB3s. To see how fast and powerful it can be, you'll have to spend a few minutes working with this high performance notebook computer.

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PRODUCT PIPELINE

● SYSTEMS

IVERSON OFFERS INEXPENSIVE 386SX-BASED SYSTEM. Iverson Computer Corp. has introduced a $1,177 386SX-based computer that runs at 20 MHz. The ICC 386SX comes with 1 megabyte of RAM, a choice of a 3½-inch or a 5¼-inch floppy disk drive, two 8-bit and six 16-bit slots, DOS 4.01 and Windows 3.0. The system is expected to ship before the end of the month. (800) 444-7290.

NORTHGATE INTRODUCES NEW LINE, DROPS SYSTEM PRICES. Northgate Computer Systems Inc. has added a line of 386- and 386SX-based Slimline computers that come with caching capabilities. The Slimline 386 Cache comes in 25- and 33-MHz versions, which cost $2,699 and $2,999, respectively. Two versions — 16-MHz and 20-MHz — are available in the Slimline 386SX Cache configuration, costing $1,999 and $2,199, respectively. The company has also reduced the prices of its Elegance 386 computers. A 25-MHz version of the system will drop to $2,799 from $3,199. A 33-MHz version of the same computer will cost $3,099, down from $3,499. (612) 943-8181.

● MODEMS

MAXLOGIC RELEASES LOW-COST MODEM. Maxlogic recently began shipping a $129 modem that transmits 2,400 bits of data per second. Called Maxmodem 24, the internal half-card modem is compatible with IBM PC, XT, and AT computers and compatibles. (415) 683-3700.

● BUNDLING

MARSTEK BUNDLES WINDOWS WITH HAND-HELD SCANNER. Marstek Inc. announced it is bundling an integrated Windows 3.0 software package with its 800 dot-per-inch hand-held scanner. The bundle costs $495, and includes limited optical character recognition (OCR), a set of paint tools, gray-scale photo processing, and a bit map-to-vector image convertor. A $595 package will include Ocron Inc.'s Omni-font OCR software, which normally lists separately for $795. (714) 833-7740.

SEIKO INCLUDES MONITOR WITH VIDEO BOARD. Seiko Instruments USA Inc. is now bundling Orchid Technology's $469 Prodesigner II video board with Seiko's 19-inch CM-2050 color monitor. The monitor/card package sells for $2,999. The CM-2050 supports VGA, Super VGA, and resolutions up to 1024 by 768 pixels, noninterlaced. The monitor also allows users to view two letter-size pages side by side. (408) 922-5900.

● GRAPHICS

VISIONETICS INTRODUCES TARGA 16-COMPATIBLE BOARD. Visionetics International is now shipping a video graphics board designed to run software developed for the Targa 16. The $1,195 VIGA-16 board captures video images in real time and accepts NTSC and analog RGB signals. It also accepts and outputs signals from VCRs and other video devices, and allows simultaneous display of 32,768 colors per pixel. (213) 316-7940.

Data Translation Add-In Boards Boost AT Computation Speeds

Data Translation Inc. has shipped two PC AT-compatible add-in processor boards that significantly speed computations required by image processing operations.

Compatible with DT-Connect frame grabbers, the DT2878 Advanced Processor lets data from partial or whole frames be analyzed by frequency. The 32-bit processor, capable of 25 megaflops, is built around the AT&T DSP32C signal processor chip. Data can be processed in either floating-point or fixed-point format, a company spokesman said.

The second board, called the DT2868 High Speed Frame Processor, carries out image processing operations about three times faster than its predecessor, the DT2858 Auxiliary Frame Processor.

Easy to program, the DT2878 is best suited for 32-bit floating-point data operations but also performs frequency analysis, morphological operations, and convolutions significantly faster than a host PC AT, according to company officials.

The DT2878, available now, with 2 megabytes of memory costs $4,495; with 4 megabytes it is priced at $5,495.

The DT2868 costs $1,995 and begins shipping on December 15.

Data Translation Inc., 100 Locke Drive, Marlboro, MA 01752-1192, (508) 481-3700.

— Ed Scannell



"I decided to buy a **Gateway 2000** system because they had everything I wanted for a good price," said Graham Pask, Computer Systems Manager for Dive 'N Surf in Redondo Beach, California. "But what really impressed me was the service. I had a problem with my 3 1/2 inch drive so they sent me a new drive the very next day." Graham said he was so happy with his Gateway system at work that he bought a Gateway 2000 25 MHz 386 Cache machine for his home. Dive 'N Surf, famous for Body Glove fashions and water-sports equipment, is just one member of the growing Gateway 2000 family of satisfied customers — a family whose members are found in all 50 states and in over 70 foreign countries. Why are so many Gateway 2000 computers appearing in so many places? Why is the five-year-old Midwest firm selling more systems through the direct market channel than any other PC manufacturer in the nation? Because people everywhere know a good value when they see one. And because people everywhere still appreciate the old-fashioned service they get from the friendly, small-town people at Gateway. Home buyers, corporate customers, small business people, international customers and government buyers all get the same excellent value and extraordinary service from Gateway 2000. Give us a call today and find out what we mean when we say, "you've got a friend in the business."



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- 101 Key Keyboard
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- 101 Key Keyboard
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$5295.00

Due to the volatility of the DRAM market, all prices are subject to change.

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WORKSTATIONS

Wyse Enters X Window Display Terminal Market

By Martin Marshall

Wyse Technology, which claims a second-place position behind IBM in the U.S. market for terminals, has entered the X Window display terminal market, predicting the market will reach half a million units per year by 1994.

At the same time, Wyse also introduced a multiprocessing server based upon CPU cards that use 25-MHz Intel i486 processors.

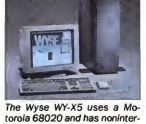
The Wyse WY-X5 X Window graphics terminal will compete directly with the NCD17 from Network Computing Devices (NCD) of Mountain View, California. NCD has been the leader in the X Window terminal market, which accounted for 11,300 terminals last year, but it now faces competition from Digital Equipment Corp. (DEC) and IBM as well.

The WY-X5 has a flat, 17-inch noninterlaced monochrome display with a 70-hertz refresh rate. Its resolution is 1,280 by 1,024, and it has built-in thick or thin Ethernet support as well as TCP/IP protocol support. It is powered by a 16-MHz Motorola 68020 processor. The WY-X5 base package includes 1 megabyte of RAM that can be expanded to 5 megabytes using standard off-the-shelf SIMM modules, the company said.

The terminal incorporates MIT's X.11 R4 (Release 4.0) version of the X Window server code. Intuitive setup menus provide access to configuration parameters, diagnostics, and network statistics. Network administration is simplified with boot file and configuration information downloaded from a central network host, or loaded locally by the node, according to the company.

A three-button mouse and choice of Enhanced PC or ANSI-style keyboard are bundled with the base system, priced at $1,799. First shipments are slated for the first quarter of 1991.

The multiprocessing server, dubbed the Series 7000i, is capable of housing up to four Intel i486 processors, but support for that kind of multiprocessing will not be forthcoming until next summer, according to Wyse. The single-processor version of the system, powered by a 33-MHz version of the i486, supported by 128K of external copy-back cache, and holding an entry-level pricing point of $18,000, will ship in December.



The Wyse WY-X5 uses a Motorola 68020 and has noninterlaced 70-hertz refresh rates.

The system is distinguished by a high-speed 64-bit system bus capable of transmitting 80 megabytes per second, and by an EISA SCSI host adaptor.

The Series 7000i, configured to support 64 users with a 3½-inch Floppy drive, a 525-megabyte SCSI tape drive, EISA SCSI host adaptor, 16 megabytes of RAM (expandable to 192 megabytes), 66-megabyte SCSI hard drive, eight WY-999's, and two WY-997's, is priced at $31,450.

Wyse Technology Inc., 3471 N. First St., San Jose, CA 95134; (408) 473-1200.

Motorola Announces The Next 88000 Chip

RISC Processor Works Five Times Faster

By Martin Marshall

BURLINGAME, CA — Calling it a sneak preview, Motorola officials gave architectural details and descriptions of the company's next-generation RISC processor, the Motorola 88110, at the 1990 Microprocessor Forum held here last week.

Intended for introduction next year, the chip will feature multiple copies of integer, floating-point, and graphics execution units, and is expected to perform from three to five times faster than the current generation of 88100/88200 processors.

The current generation of 25-MHz Motorola 88100 processors performs at about 20 million instructions per second (MIPS), so the 88110 chips could be expected to perform in the 60-to 100-MIPS range. Furthermore, because the chips are designed for multiprocessing of up to four units, a four-processor system generating 400 MIPS could be constructed.

"It's a superscalar design with 80-bit-wide internal data paths," said Jeff Nutt, marketing manager for Motorola's 88000 family.

The 88110 will be a single-chip implementation that combines the functions of its software-compatible predecessors, the 88100 CPU and 88200 cache and memory management units. Where the 88000 architecture allows for up to eight execution units, the 88110 defines three separate execution units for integer, floating-point, and graphics operations. As with the previous chip, rigorous bus-snooping logic allows the 88110 to be used in symmetric multiprocessing schemes.

"We are not seeing any slackening of the demand for compute power among our customer base," said Nutt, who pointed to the increased use of graphical user interfaces, the drop in cost of large amounts of RAM, and the increased use of higher level programming interfaces as driving forces behind the demand for more power. The establishment of enterprisewide servers for database information and the increased interoperability of heterogeneous computers on a network also allows for 88110-based systems to act as compute servers for a wide variety of workstations and terminals, he said.

See Motorola, Page 32

Tektronix Server Based on 88100 RISC Processor

By Martin Marshall

Making what appear to be exaggerated claims about speed performance, Tektronix Inc. last week introduced a very powerful multiprocessing server based on the Motorola 88100 RISC processor.

The Tektronix XD88/700 server can hold up to four 88100 processor cards and is optimized for visualization applications, the company said. Tektronix claims performance of up to 120 millions of instructions per second (MIPS) for a four-processor system and 67 MIPS for a two-processor system, even though Motorola itself only claims a rating of 20 MIPS for the 25-MHz 88100 processors used in the system. Using Motorola's figures, a dual-processor 25-MHz version should top out at 40 MIPS, and a four-processor version should perform at about 80 MIPS.

Each system comes bundled with Tek's Tekimaging image processing software and can run all software that complies with the BCS (binary compatibility standard) established for the Motorola 88000 family of processors.



The Tektronix XD88/700 series can hold up to four Motorola 88100 RISC processors and handle six LANs.

It can also act as a file or compute server in heterogeneous, networked environments that include X Window graphics terminals, diskless workstations, and workstations.

Fully loaded, the XD88/700 can support up to six LANs, more than 80 gigabytes of disk storage, 256 megabytes of RAM, and FDDI fiber-optic data connections. It has a 20-slot VME card cage and drawers for up to 78 SCSI or 24 dual-ported IPI-2 mass storage devices. FDDI, NFS, and X Window support is bundled with the system.

More than 1,500 applications now comply with the BCS, and can thus be run on the XD88/700 server, according to officials of the 88/Open consortium.

The servers will begin shipping in November. Prices start at $62,200 for a dual-processor model XD88/720 with 16 megabytes of RAM, SCSI interface, LAN connection, a 1.2-gigabyte hard drive, and a 525-megabyte streaming tape.

Tektronix Inc., Box 1000, Wilsonville Industrial Park, Wilsonville, OR 97070; (800) 225-5434.

USL to Bundle Locus' Connectivity Software

Deal Will Contribute to Unix System V 4.0

By Ed Scannell

As part of a partnership deal, AT&T's Unix Systems Laboratories (USL) will bundle Locus Computing Corp.'s Unix-to-DOS connectivity software with future reference implementations of Unix System V, Release 4.0.

The announcement is part of USL's response to Unix International's System V Roadmap, a schedule of future extensions to Unix developed by major Unix OEMs and users. Locus was chosen because AT&T believes that Locus can make a major contribution toward Unix System V, Release 4.0 being the accepted open systems PC integration platform, a spokesman said.

The connectivity software, which Locus calls PC-1, makes it possible for DOS users to access the full capabilities of Unix while remaining in the more comfortable environment of DOS.

AT&T will be bundling the server portion of PC-1, which is responsible for distributing files and printer services to DOS-based workstations requesting them. That portion of PC-1 that acts as the DOS bridge will not be included in the bundle, said Peter Uhlir, product marketing manager for Locus.

"One reason AT&T chose the server portion is it doesn't require a lot of work on the part of the Unix administrator," Uhlir said. "It is pretty easy to use," he added.

Locus' PC-1 will be available on all Unix SVR4 reference ports including the 80386/80486, Motorola 88000, the Intel i860, and the MIPS and Sparc processors.

Locus Computing Corp., 9800 La Cienega Blvd., Inglewood, CA 90301-4440; (213) 670-6500.

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*PC Magazine, October 31, 1989

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PRODUCT PIPELINE

● NETWORK MANAGEMENT

HP OPEN VIEW PORTED TO SUN ENVIRONMENT. Hewlett Packard announced last week that its HP Open View Network Management server software environment will be ported to run on Sun Sparc platforms. The software enables users to write applications that find, share, use, and manage the resources on a heterogeneous network. It gives access to all nonstandard Management Information Base variables, including Novell LANtern and HP LANprobe products, for network analysis. It also provides management of multivendor Simple Network Management Protocol (SNMP) and an SNMP-based agent for Apollo systems. Open View Windows and Windows 3.0 will also be supported on DOS platforms. Availability is scheduled for the second half of next year, with an end-user price of $7,000 and an applications developer package for $30,000. (800) 752-0900.

NCR LICENSES AT&T'S LAN MANAGER/X. NCR Corp. has licensed AT&T's LAN Manager/X Server and plans to incorporate the AT&T technology into its NCR LAN Manager/X product for the NCR System 3000. Single and multiprocessor versions of LAN Manager/X will be available under Unix System V, Release 4.0, with support provided for multiple LAN protocols within both Ethernet and IBM Token Ring Networks.

● BACKUP

LEGATO BACK PACK BACKS UP HETEROGENEOUS NETWORKS. Backup and recovery for networks including Sun, DOS, HP-UX, DEC Ultrix, Solbourne, and MIPS Computer systems can now be made on the Legato Back Pack, Legato Systems announced last week. The system includes an 8mm tape drive that holds 2½ gigabytes of storage on a single cartridge. Although it is capable of recovering files from heterogeneous systems, the software runs on a Sun server. It is priced at $5,295 and will ship in November. (415) 329-7863.

● BENCHMARKS

IBM BEATS OUT DEC, SUN IN AIM BENCHMARK. The IBM RS/6000 Power Server 530 has nearly twice the overall system performance of the Sun Sparc-Station 370 server, and nearly three times the performance of a DEC System 5810, according to an AIM Performance Report released last week. AIM used its Load/Mix modeling technique to simulate the resource loading and instruction mix of an actual user environment, said AIM president Jim Geers. (800) 848-UNIX.

● SECURITY

EUROPEAN SECURITY SYSTEM COMES TO U.S. Com-Lock, a hardware device that shields modem lines from unauthorized external intrusion, is now being distributed in the U.S. The device requires an eight-digit security code to be transmitted by the external party. It works with any computer system, said Upgrade General Import/Export. It is priced at $3,995. (800) 535-3751.

Motorola

Continued From Page 29

Motorola also disclosed the development of a line of 88000-based embedded control processors named the 88300 family. No further details about the chips were given, however.

At the same time, Motorola lowered prices on the 16-, 20-, 25-, and 33-MHz members of its current 88000 family. Quantity pricing on the 16-MHz version of the 88100 dropped to $49, with similar reductions for the other chips: $75 for the 20-MHz device, $101 for the 25-MHz version, and $150 for the 33-MHz chip. The pricing on the 88200 floating-point units dropped to $87, $116, $153, and $232, respectively, for the different speed chips.

Nutt acknowledged that the market for the Motorola 88000 family is still in an embryonic stage and that, so far, only 60 of the 1,500 applications written for 88000-based machines have been certified by 88 Open as BCS (binary compatibility standard) compliant.

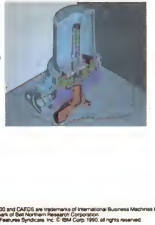
The lack of a major-systems vendor selling 88000-family-based systems may hamper the acceptance of Motorola's 88000 family, industry observers said. Although 88 Open officials point to a list that includes Data General and Tektronix, the endorsement of Apple Computer continues to elude the Motorola 88000 group.

Motorola Inc., Microprocessor Products Group, 6501 William Cannon Drive W., Austin, TX 78735-8598; (512) 891-2839.

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OSF Establishes Pricing Schedule, Licensing Terms for DCE

BY ED SCANNELL

The Open Software Foundation (OSF) has announced a pricing schedule for its Distributed Computing Environment that it hopes will attract customers using a wide range of hardware and software environments.

"Our first objective [in setting pricing] was to establish licensing terms that enable people to use the technology," said Jonathan Gossels, OSF's business area manager. "Since this is interoperability technology, it makes sense to price it so people could afford to deploy it," Gossels said.

DCE can be licensed as separate components and is divided into two categories of the DCE Executive and DCE Services, Gossels said.

The DCE Executive, previously referred to as data sharing services, includes remote procedure calls to simplify network programming; a basic file service to provide a consistent view of the file system; threads, which make it easier to program for parallel processing environments; and various hooks to connect to directory services.

The DCE Services are a set of services to complement the DCE Executive. They include the directory service, which stores and gives access to names for objects, a security service, an advanced file service that provides management services for large network configurations and PC integration services that extend DCE to DOS and OS/2.

"The DCE Executive is analogous to a cable-ready TV in that no matter what brand computer you have, by using it you have a distributed computing-ready computer," Gossles said. "The DCE Services then, are the cable services, like MTV, you add to it."

The cost of a three-copy source code license with full object redistribution rights is $60,000. A commercial site license for a source code license is $90,000.

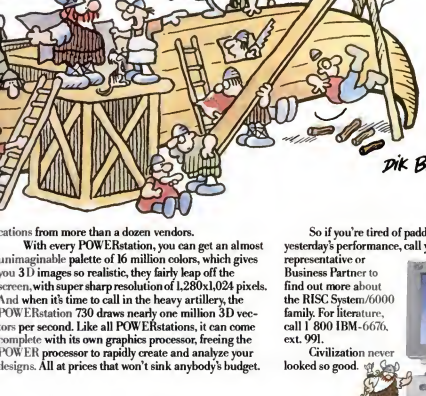
A three-copy source code license without redistribution rights aimed at software developers costs $15,000. Additional source code copies are priced at $5,000. The upgrade fee to full distribution rights license is $50,000.

OSF is making a university site license available for $5,000.

The individual DCE services are priced this way: Directory Service, $400; Security Service, $400; Advanced File Service, $500; X.500 Directory Service, $250; PC Integration Service, $800. Volume discounts per 12-month ordering period on the DCE Executive range from $75 for one to 500 copies and $10 for 500,000 or more copies.

Open Software Foundation, 11 Cambridge Center, Cambridge, MA 02142; (617) 621-8700.

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will seem downright primitive.



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So if you're tired of paddling upstream with yesterday's performance, call your IBM marketing representative or Business Partner to find out more about the RISC System/6000 family. For literature, call 1 800 IBM-6676, ext. 991.

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IBM

Xoftware for Unix Lets Users Upgrade PC Graphic Workstations

BY TOM QUINLAN

AGE Inc. will announce Xoftware for 386- and 486-based Unix users this week.

The product is designed to enable PC Unix users to inexpensively upgrade their systems into graphic workstations.

The $595 package is designed to work with either SCO or Interactive Systems Corp.'s Unix System V/386 environment, and with TI's TMS 340 graphics coprocessor.

While Xoftware for the PC is essentially the same technology that AGE uses to provide X-terminal capabilities for various processors, the thrust of the product is essentially different, said Gary Gwin, marketing manager for AGE.

Xoftware for the PC is an inexpensive way to transform their systems into low-cost graphics workstations, Gwin said.

In addition, Intel, in an effort to bolster acceptance of its i960 RISC microprocessor, has contracted with AGE to provide a version of the Xoftware product for Intel's RISC controller.

The first version of Xoftware for the i960 will be compatible with X11, Release 4, and is expected to start shipping in the first quarter of 1991.

At the same time, AGE has agreed to port its TCP/IP implementation, Xoftnet, to the i960 processor as well.

AGE Inc., 8765 Aero Drive, Suite 226, San Diego, CA 92123; (619) 565-7373.



TECH TALK ■ BY STEVE GIBSON

The Continuing Adventure to Understand SCSI Performance

Last week we began my saga of "Why I wish I hadn't bought SCSI." I now realize that my biggest problem was probably that I decided to upgrade many hardware and software components of my system all at once.

I changed my motherboard, hard disk controller, and bard disk controller technology (from ESDI to SCSI) at the same time I began working with Windows 3.0, a new unreleased fax board, and both of Quarterdeck's and Qualitas' then-unreleased memory managers. When I got my new system reconfigured and plugged together, nothing worked. Every so often a drive light would flicker briefly, as if this buge monster was slowly struggling toward consciousness. After a while I decided that it was teasing me, daring me to tackle the enigma that I had created.

Naturally, I did. I've grown so dependent upon my computer system for my daily life that I could scarcely endure this state of affairs. So I stepped back to the earlier beta of 386-to-the-Max, which I'd been using for months, and things got somewhat better. It seemed that this unreleased Max was in transition from 16- to 32-bit segments internally and was having some trouble with the scope of my "maxed out" 486. Of course, this meant that I bad to suspend my work with Enhanced-mode Windows 3.0, but that was of lesser concern.

Still, the entire system would freeze up from time to time; my trusty old Everex tape drive would lie there groaning; and I still couldn't fax. Wondering whether the problem might lie with the Mylex SCSI controller, I backed away from it too. But since I had just invested in this 330-megabyte Maxtor hard disk, I went in search of SCSI alternatives.

I first switched over to Adaptec's new 1542 bus-mastering SCSI host adapter. Near as I can tell, this is a nice board but it doesn't get along with QEMM 5.1. Whenever they are together in the same system, things lock up immediately. Someone's got a problem there. One of the things I did notice about the bus-mastering Adaptec 1542 was that it was much slower than the Mylex. This got me started off on a separate adventure to understand what was going on with SCSI system performance.

So I assembled a complex series of SCSI performance benchmarks to experiment with different styles, rates, and amounts of data transfer between CPU and hard disk subsystems. I ran 10 different SCSI adapters through their paces. Some were bus masters, some had 50 chips and Motorola 68000 processors, and some had as few as three lonely ICs on a small PC board. Would you believe that with only one exception every SCSI adapter performed identically?

The fact is that the physical transfer onto the hard disk drive's magnetic medium is the bottleneck in any SCSI system, and the issue of SCSI adapter "performance" is lost behind the issue of SCSI hard disk performance.

One thing really did anger me. I happened to have a tiny 3½-inch, half-beight 200-megabyte SCSI drive on loan from Conner Peripherals. This fast and sexy gem consistently delivered a 300 percent higher read performance than my expensive, apparently brain-dead Maxtor SCSI drive. Whatever the Conner drive is doing in the way of internal read-ahead cacbing sure works. Other SCSI drive makers would do well to pay attention.

The exception in SCSI adapter performance was delivered by Mylex's bus-mastering controller with its 4-megabyte, on-board cache. The beauty of such a large on-board cache is that the drive's performance is effectively decoupled from the CPU system. The adapter can accept a write request from the system and utilize the inherent performance edge provided by bus mastering to move the system's data into its cache for background writing to the hard disk.

Steve Gibson is the developer and publisher of Spin Rite and president of Gibson Research Corp. of Irvine, California. The views expressed are his own.

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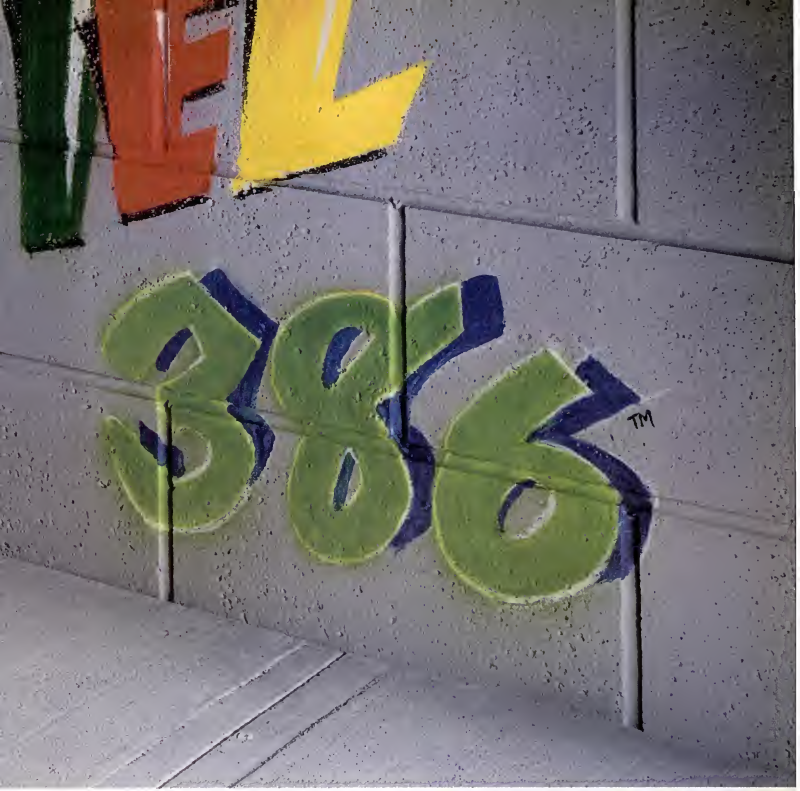


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NETWORKING

Synernetics Unveils Suite Of Multiplexing Products

Products Provide Smooth Transition to FDDI

BY BARBARA DARROW

SAN JOSE, CA — Last week at Interop, Synernetics Inc. unveiled a suite of LAN connection and management products that rely on signal multiplexing to get the most out of end-station-to-wiring-closet Ethernet links and provide a smooth transition to FDDI, according to Bruce McClure, company chairman.

"If you have a couple of Suns [workstations] running graphical applications on a LAN, Ethernet runs out of gas pretty quick, but we can't expect a wholesale change to FDDI at the desktop," McClure said.

By multiplexing the Ethernet signals, this product runs many LANs in parallel, and the user can cram more information down the 10-megabit-per-second Ethernet tube and onto FDDI, McClure said.

The Lanplex 5000 concentrator, the focal point of this offering, accommodates up to 12 eight-port modules for connecting to Ethernet LANs. The slide-in Ethernet Express modules multiplex the LAN connections to the concentrator's 2½-ring FDDI backplane.

Multiple FDDI rings ensure redundancy and support for dual-attach boards, where other concentrators use a single FDDI ring, McClure said.

Ethernet-to-FDDI translation is accomplished via RFC 1042, according to product manager Tom Medrek.

Each eight-port Express module includes a 68030 processor dedicated to management and diagnostics, and an AMD 29000 RISC chip for packet processing, as well as its own communication line and integrated modem for remote monitoring, Medrek said. Each module can handle up to 256 Ethernet end-stations.

Finally, Synernetics will dive into the LAN management arena with Viewplex software, based on Sun Microsystems' Open Look. This object-oriented software ensures that the administrator can treat every machine on the network as a separate, self-describing object, and add new nodes easily, according to McClure.

The software was developed on Sun machines but will port to any Unix box, according to McClure. Viewplex provides Simple Network Management Protocol (SNMP) and Ethernet management at the port level, he said.



Lanplex 5000 operates many LAN segments in parallel and multiplexes them onto FDDI.

The products, which have yet to enter beta testing, are scheduled to ship in the second quarter of next year.

A Lanplex 5000 configured with one Ethernet module and two FDDI ports lists for $33,900. Additional eight-port Ethernet Express modules cost $11,000. Medrek estimated that the average cost per port connection is less than $1,700 for a fully stuffed box.

Future offerings will include token ring modules and an FDDI-to-FDDI bridge.

For users with fewer Ethernet devices, the Lanplex 2110 is a scaled-down multiplexer that comes in one configuration accommodating eight Ethernet Express ports and two FDDI ports for $19,900.

Viewplex LAN management software also starts at $19,900.

Synernetics, Inc., 85 Rangeway Road, North Billerica, MA 01862; (508) 670-9009.

■STANDARDS

Corporate Move Is on To Define Standards

BY YVONNE LEE

As corporations expand departmental LANs into enterprisewide WANs, they are beginning to pay more attention to defining corporate standards.

"In the past, by-and-large de facto standards were the norm," said James Chappell, president of The Connectivity Lab Inc. "I think with the changing attitudes toward the corporate need to integrate, the international standards become much more important."

Nevertheless, Open Systems Interconnect (OSI) products are not widely available at the upper layers, Chappel pointed out. While physical layer standards such as Ethernet, token ring, and 10Base-T have gained acceptance, organizations are sticking with de facto standards, proprietary products, and TCP/IP for E-mail, file transfer, and network management.

In determining a standard within a corporation, organizations have typically taken one of two opposite approaches. In the first, departments choose their products then later attempt to meld those solutions with others. The second is a top-down approach where products are mandated from a systems group. Both methods have been employed at Arco Oil and Gas Co.

"The advantages to centralization of the technology evaluation is it focuses the place where the bleeding edge is viewed by the world," said Ray Chandler, network specialist in the planning and technology group. "It's more of a support issue. We don't want to bring technology in that the rest of the organization isn't ready to handle."

The disadvantages, Chandler said, are that with centralized planning, it may take longer to implement a solution, and the solution may not be the best for a specific problem. "The community that we support is very segmented. They have their own business problems," Chandler added. "If they were doing it themselves, they would probably react to it more quickly."

In the early '80s, Novell products became a standard at Arco because one department had successfully implemented Novell's S-Net. In that respect, Arco adopted what Diane Danielle of Wells Fargo refers to as "the first kid on the block syndrome," where companies adopt technology based on what they already have.

At Partners National Health Plans, in San Diego, corporate standards are dictated by the parent company, Aetna. But it will remain with Netware, instead of implementing the corporate standard, LAN Manager, said Doug Hampshire, information center analyst. "In that case, it kind of defeats the purpose of having a standard because it's not really a standard. [In] the next three to five years, you're not going to get any return on investment on switching from Netware to LAN Manager," he said.

Another problem lies in determining whether something such as a network operating system will truly become a standard, irrespective of the vendor's claims. Whoever made the decision at Wells Fargo to buy IBM's PC LAN program, because IBM sold it, got sold a bill of goods, Danielle said. "That 'standard' didn't turn out to be much of a standard." ■

IBM Joins Diskless Workstation Market With 386SX Machine

BY JODI MARDESICH

Moving with the speed of a snail, IBM last week entered the diskless workstation arena with its PS/2 Model 55 LS (LAN Station), a diskless version of the company's 386SX workstation.

Based on a 16-MHz 80386SX processor with 2 megabytes of RAM, the Model 55 LS has two 16-bit expansion slots. It comes with either a Token Ring or Ethernet adapter. A Remote Initial Program Load feature lets users install the system in either Ethernet or Token Ring Networks.

The workstation has optional 30-megabyte and 60-megabyte disk storage bays and a 1-inch-high 1.44-megabyte diskette bay. The 30-megabyte fixed disk drive costs $695, the 60-megabyte fixed disk drive costs $1,000, and the 1-inch-high 1.44-megabyte diskette drive kit is $30; all are available now.

The 55 LS Token Ring model, available now, can run DOS 3.3 or 4.0, and can be used on an IBM OS/2 LAN Server 1.2, Novell Netware 286 or 386, Banyan Vines, or IBM's PC LAN Program network. It is priced at $3,490.

The Ethernet model, which currently runs on Netware or Vines networks only, is priced at $2,950 and will be available in November.

IBM's diskless workstation is relatively late to the market. Competitors' products have been shipping for at least 3 years.

IBM also introduced a Micro Channel Ethernet adapter. The PS/2 Adapter/A for Ethernet networks is priced at $575 and will be available in November.

Synchrony 2.0 Manages Updates, Retrieves Files and Shared Programs

Distribution and installation of PC programs and data are mainframe tasks with Synchrony, new electronic distribution and retrieval software from Packet/PC Inc.

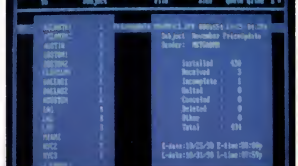
The software manages updates for end-users, and it also retrieves files and programs for processing and shared access, the company said. It consists of a program running on an IBM System/370 mainframe under CICS (Customer Information Control System) and a client application running on DOS or OS/2 machines.

The PCs are attached to the host via 3270 emulation hardware or dial-up 3270 connections through the company's Packet/3270 or IBM's Fterm.

Developed at The Travelers Insurance Co. to solve internal distribution problems, Synchrony 2.0 is available now and sells for $30,000 for the first mainframe, and $75 to $195 per PC, based on the quantity purchased.

Packet/PC Inc., 270 Farmington Ave., Farmington, CT 06032; (203) 678-1961.

— David Coursey



Synchrony shows on-line status of distributed PC software.

PRODUCT PIPELINE

INTERNETWORKING

CABLETRON ADDS FDDI LINK TO MMAC. Cabletron Systems added an Ethernet-to-FDDI bridge module for its intelligent wiring hub. The Multi Media Access Center (MMAC), initially an Ethernet-only product, now also accommodates token ring and FDDI connections. Network management is supplied by the company's Remote Lanview software. Cabletron expects to ship the EFDMIM module in 60 days. It will sell for $19,995.

OPERATING SYSTEMS

NCR LICENSES AT&T'S LAN MANAGER/X. NCR is the sixth company to license AT&T's LAN Manager for Unix (LAN Manager/X), which NCR will offer in single- and multiprocessor versions on its System 3000.

NETWORK MANAGEMENT

WINDOWS FRONT END ADDED TO LANALERT. Network Computing Inc.'s LAN Alert network management system will get a graphical front end based on HP's Openview DOS. Available concurrently with Network Computing's Node Agent for Network are the first quarter of 1991, the LAN Alert Openview Console will give administrators a graphical map of their network. Pricing has not been set. (214) 746-4949.

FAX SOFTWARE

DIGITAL DATA SYSTEMS INTRODUCES FAX SYSTEM FOR NETWARE. Digital Data Systems Inc. announced Qfax, a fax system for Netware 286 composed of a value-added process (VAP) and a fax modem. Digital Data's dds4000 fax modem emulates a system printer and attaches to either a file server or a bridge. Qfax is shipping this month and costs $2,995. (313) 258-1122.

MICRO TO MAINFRAME

IBM OFFERS 3COM ETHERNET MICRO CHANNEL CARDS. 3Com's Etherlink/MC Micro Channel Ethernet adapters will be part of IBM's 3172 Interconnect Controller that connects LANs to IBM System/370 or System/390 mainframes. LAN users on Token Ring, Token Bus, Ethernet, or FDDI wiring schemes can now access TCP/IP, OSI/MMS, AIX/370, and Systems Network Architecture applications on the host computer. The adapter is installed in PS/2 workstations, linking them to the 3172 controller. Up to four Etherlink/MC adapters can be installed on the 3172's Micro Channel bus so multiple LANs can access IBM host resources.

Walker, Richer & Quinn And Sun Sign Agreement

Products to Offer Terminal-Based Connectivity.

BY ED SCANNELL

Citing the needs of PC-NFS users to better connect to TCP/IP environments, Walker Richer & Quinn Inc. has signed a development agreement with Sun Microsystems Inc. to create Telnet terminal emulation capabilities for Sun's PC-NFS products.

The products that will result from the agreement should provide users with the software necessary to access applications on several different minicomputers as well as IBM mainframes.

With the rapid spread of open system networking products, officials from both companies believe corporations have an increasingly important need for more capable terminal-based connectivity to get at the large amounts of data sitting on host systems.

"There are lots of companies out there with huge chunks of data on host systems," said Steve Brockway, market development manager for Walker, Richer & Quinn Inc. "We will be trying to give them the terminal emulation they need to reach that data," Brockway added.

The length of the agreement is three years and can be extended by either party. Officials from both companies declined to say when the products would be available or what their prices would be.

In an unrelated announcement, Walker Richer & Quinn has introduced a series of products that provides networked PCs with a path to information on a range of different host systems.

Called the Network Connection Series, the line is made up of four separate products ranging from a basic LAT connection that gives PCs access to Digital Equipment Corp.'s VAX in an Ethernet environment to a connection that lets PCs talk to almost all host systems across a network.

The LAT Connection, priced at $99, offers a basic terminal connection over Ethernet to a VAX. The Telnet Connection provides terminal emulation over TCP/IP networks and high-speed FTP file transfer protocol within a terminal session. The Telnet Connection program also costs $99.

A third product, the TCP Connection, has its own TCP/IP stack and also contains the LAT and Telnet connections. The program costs $199.

The 3000 Connection gives single PC users the ability to talk with a Hewlett-Packard, VAX, and Unix hosts as well as Novell and 3Com servers. The 3000 Connection costs $299.

All four products are expected to be shipped by November 15.

Walker Richer & Quinn Inc., 2815 Eastlake Ave. E., Seattle, WA 98102; (206) 726-7220.

Half-Height Modem Offers Laptop-to-Host Connection

BY DAVID COURSEY

Microgate Corp. is giving laptop-to-mainframe connectivity a boost with a half-height modem designed to provide a dial-up link from portable PCs to IBM hosts.

The company's new SV32i product is an integrated SDLC adapter and V.32 synchronous modem that fits into the half-height slot available in many laptops, according to Brad Maughan, president of Microgate.

The modem joins a Micro Channel Architecture (MCA) version that was introduced nearly a year ago. Both products offer mainframe links at up to 12,000 bits per second (bps) over regular dial-up or dedicated telephone lines, according to Maughan.

The ISA card, scheduled to ship in December, will sell for $1,425; the MCA version, available now, is the same price. A synchronous/asynchronous version, probably in a full-height card for MCA and half-height for ISA, will be announced next month, Maughan said.

The company also recently introduced a half-height V.42bis modem, supporting up to 4-to-1 data compression at 2,400 bps, providing 9,600-bps throughput, Maughan said.

The modem also supports standard V.22bis, 1,200-, and 2,400-bps communications and the Hayes AT command set, as well as MNP protocols 1 through 5. It sells for $299.

Later this year the company plans to release a Nubus version for the Macintosh.

Microgate Corp., 9501 Capital of Texas Highway, Austin, TX 78759; (512) 345-7791.

Low-Cost LANs: Pros and Cons

Pros	Cons
● Cheaper: $1,000 to $1,500 range for a typical 4-node peer-to-peer network including software, adapters and cabling vs. $1,400 to $2,000+ for a Novell ELS network	● Can't connect over an Internetwork
● Easier user interface and easier installation	● Can't have MIS manager administer the network remotely
● No need to dedicate server; saves the cost of the server	● Can't hook up to hosts

Small peer-to-peer LANs cost less than most traditional network systems, but users have fewer options for adding on in the future.

TECHNOLOGY UPDATE

Peer-to-Peer LANs Are Low-Cost Alternative

Savings Come at Expense of Interconnectivity

BY YVONNE LEE

Organizations can save money with peer-to-peer LANs, but they do so at the expense of network management and interconnectivity, according to analysts and consultants.

Users in departments who need to share data and peripherals can save money by installing these low-cost LANs, which don't require a dedicated file server.

Peer-to-peer networks have tackled the performance issues, and several now work as quickly as standard server-based networks. They often have menu-driven or tree structure interfaces, making them easier to use and administrate than full-fledged LANs.

Although even cheaper devices exist for sharing peripherals, the low-cost LANs offer a solution for delivering and sharing data not found in "sneakernet" or in the peripheral sharing solutions.

"With sneakernet, we can exchange data, but we can't share it," said Vincent Wu, president of Invisible Software, in Foster City, California.

Despite these advantages, experts caution that peer-to-peer networks are not a good long-term solution in a corporate environment.

"In the large capitalized corporation, I would say low-cost LANs are both a curse and a blessing," said Kenneth Zoline, president of Zoline and Associates, in Chicago.

Zoline pointed out that the incapability of these networks to connect to other LANs makes it impossible to remotely administrate them.

"More often than not, a lot of end-users don't have time to take care of their backups like they should. They don't have time to manage them," Zoline said. "There's a move towards having corporate MIS groups managing all networks."

Lee Doyle, manager of network research at International Data Corp., in Framingham, Massachusetts, estimates that peer-to-peer networks are being used or considered by about 5 percent of the corporate market. The networks are useful in small, isolated work groups, he said.

The isolated nature of peer-to-peer networks can cause problems as organizations try to meld their LANs into enterprise-wide networks.

Not only do these networks lack bridging and routing capabilities, but they also lack features that allow them to connect to and emulate mainframes, according to Michael Heylin, network analyst at Creative Strategies Research Inc., in Santa Clara, California.

Moreover, in many cases, these networks require proprietary network interface cards and cabling. These must be replaced when a company moves toward larger internets.

If anything saves the peer-to-peer network from doomed isolation, it is that several companies are working to broaden the scope of interface adapters that their systems can use.

Recently, Webcorp of Sausalito, California, announced a hardware-independent LAN that works with any network interface card with a Network Driver Interface companies, such as Artisoft of Tucson, Arizona, and Invisible Software, Inc. of Foster City, offer Ethernet cards that can be used with other network operating systems.

Using a network operating system that supports IEEE standard interfaces can help managers preserve their investments by eliminating the cost of updating hardware as an organization grows, or needs greater connectivity. □

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MACINTOSH NEWS

PRODUCT PIPELINE

HARD DISKS

911 UTILITIES SHIP. Microcom Software has released its **answer** to hard disk utilities, the Microcom 911 Utilities. The $149.95 package includes a 300-page troubleshooting guide with diagnostic tips, 1st Aid for file recovery, Virex for virus protection and detection, **Complete** Undelete for recovering **deleted** files, and Sector Collector to rid a hard disk of bad **sectors.** Microcom will continue to offer the $99 Virex and the $79.95 Complete Undelete separately. (919) 490-1277.

INTERNAL HARD DISK FITS NEW MACS. Storage Dimensions expects to ship November 1 two 1-inch high internal hard disks designed specifically for the new Macs that will be introduced this week. Like other Storage Dimension hard disks, they are Appleshare and Tops compatible. The 40-megabyte drive will cost $759, and the 80-megabyte disk will cost $1,059. (408) 879-0300.

GRAPHICS

CHESHIRE SHIPS. Abbot Systems Inc. has started shipping Cheshire, a Mac charting utility, which gives users of Microsoft Word, Aldus Pagemaker and Claris' Mac Write II and Mac Draw II access to 20 preconfigured chart modules. The $125 Cheshire is designed to reside as a utility within any of those programs, so users can quickly convert data into charts without leaving the main application. (914) 747-3116.

IMAGE COMPRESSOR ANNOUNCED. Advent Computer Products will begin distributing in early 1991 the Image Compressor, a Mac II card manufactured by the British firm Neotech Ltd. The card, tentatively priced under $1,300, is built around C-Cube Microsystems' CL550 processor, a single VLSI chip that conforms to the Joint Photographic Experts Group standard. (619) 942-8456.

SUPERMAC BUNDLES COMPRESSION SOFTWARE. Supermac Technology announced that it is bundling its Super Squeeze image compression software with all its color graphic cards **and** storage systems. The software, codeveloped with C-Cube Microsystems, supports C-Cube's newly proposed Image Compression Interface standard and complies with the Joint Photographic Experts **Group** standard. (408) 245-2202.

Lasermax Unveils First True Image Macintosh Printers

BY KRISTI COALE

Lasermax's 1200 Personal Typesetter, with True Image support, is set to ship this year.

Lasermax Systems is out of the gate with the Macintosh community's first True Image printers, recently unveiling a pair of entries.

The Lasermax 400 Personal Printer boasts a 400-dot-per-inch (dpi) resolution and is based on the popular Canon LBP-LX four-page-per-minute (ppm) engine. The $1,995 printer is Postscript-compatible and supports Type 1. It will also support True Type fonts when they become available, the company said.

On the high end, the company also introduced the 1200 Personal Typesetter, a 1,200-dpi printer that produces output on 11-by-17-inch pages. Like the 400 Personal Printer, the $15,995 Personal Typesetter supports Type 1 and True Type. Both printers are set to ship before the end of the year.

Subscribing to the philosophy of treating printers as dumb devices, Lasermax has engineered a Nubus board for the Macintosh II family of computers that contains all the True Image rasterizing information; this board is included in the price of the printer.

With this board, the burden for building a page rests with the processor in the Macintosh, and not with a controller board in the printer. This turns the Mac II into a server for the printer as well as for other Macs hooked up to a network.

Licensing agreements for True Image leave developers the freedom to implement the source code however they choose, according to Microsoft's printer business unit. This means that although Lasermax is implementing True Image through a Nubus board, other vendors may choose to develop a controller board that goes into a printer.

Lasermax Systems, 7150 Shady Oak Road, Eden Prairie, MN 55344; (612) 944-9696.

Disk Paper Creates Self-Contained Files

Farallon Product Accommodates Any Mac

BY PAUL WORTHINGTON

Macintosh users can send and read self-launching documents that deliver the appearance and even the sound of a file as it was created with Farallon Computing Inc.'s new Disk Paper.

Farallon also announced versions of its Media Tracks and Sound Edit software for the newly announced Macintosh LC and IIsi.

The $149 Disk Paper, scheduled to ship by year end, is aimed at the emerging electronic document distribution field. "Document distribution should be a standard function of every network," said Chris Logan, product manager. "Disk Paper solves the problems created by users having varied Macintosh systems, numerous applications, and different fonts."

With Disk Paper's application-independent document format, a user can call up any Disk Paper document regardless of the Macintosh model, color capability, or available fonts used to create it. The Disk Paper application prints the document to a hard disk, and retains in that file multiple representations of the same document. Even an image created on a 32-bit color system can be called up on a black-and-white Mac Plus, as the Disk Paper application applies a pattern dither to the color image to make it legible in monochrome.

The application is called under the "Print" command. No royalty fee is charged to include the Disk Paper Reader run time with a document.

Disk Paper also supports the new Sound Manager included with Apple's System 6.0.6 and the sound hardware of the new machines announced this week, as well as Farallon's own Mac Recorder sound system for older models. Users can add a vocal annotation to a Disk Paper document, and the annotation can be played back on older machines that lack either the new system software or sound hardware.

Farallon Computing Inc., 2000 Powell St., No. 600, Emeryville, CA 94608; (415) 596-9100.

Apple Wraps True Type; Will Ship With System 7.0

Specification Is Now Available to Developers

BY KRISTI COALE

Pummeled for the last several months over the seemingly vaporous quality of its outline font technology, Apple Computer Inc. may soon be able to put its True Type where its mouth is.

Apple froze the specification for True Type in August, and the published specification is now available through Apple Programmers and Developers Association (APDA), said Jim Stoneham, Apple's typographic product manager.



With the specs set, Apple can now devote its efforts to developing font-building tools, testing fonts, and helping font vendors with their True Type efforts. A newer beta version of System 7.0 that includes the feature-locked version of True Type is scheduled for release soon to developers as well.

END-USERS STILL WAITING. Although end-users still won't see True Type on their Macintoshes until the release of System 7.0, now expected sometime in the first half of 1991, they will be hearing about font libraries becoming available as the release date for System 7.0 draws closer. Although Stoneham wouldn't name the vendors whose fonts will be included in the core set scheduled to ship with System 7.0, he did acknowledge that Apple is planning to include some typefaces it has been developing.

FONT OPPORTUNITIES STILL ABOUND. However, this does not mean that Apple is getting into the font business; it just wants to better understand the tasks awaiting its font developers, the company said.

"We needed to develop some fonts to understand the vendor's point of view of building fonts," Stoneham said, adding that type creation has helped Apple test the font-building tools it plans to make available to would-be True Type developers.

Apple is trying to ensure True Type's compatibility with the Macintosh printer community. In addition to keeping other printer vendors abreast of True Type developments, Apple is enhancing its Laserwriter drivers for System 7.0.

In any case, users should see no difference in the printing process, except in price.

Because the rendering intelligence for True Type exists in the font rather than the printer and because the technology will come as part of the system software, users should see the price of high-resolution printing dropping below today's prices, Stoneham said. □

PRODUCT SPOTLIGHT



Storm Technology of Palo Alto, California, is bundling its $199 Picture Press Accelerator compression software with its recently released twin-DSP, Nubus card. The $999 Picture Press Accelerator stores some of the compression code on board to attain 60 MIPS performance, compressing or opening images at the same speed as uncompressed files. Users can compress part of an image, or the entire photo. (415) 322-0506.

First Users Find Lotus' Business CD ROM A Ready Resource

By Barbara Darrow

Direct-mail marketers and others interested in refining their contact lists might be able to use Lotus Development Corp.'s recently released CD ROM data and data analysis tool for the Macintosh.

The single CD ROM disc in Lotus Marketplace Business contains 7 million business listings with addresses, phone numbers, Standard Industry Code classifications, and CEO listings. For $695, users get access to 5,000 names, and can pay for additional access.

"If you want all the welding shops in North Dakota with more than five employees, the list comes up and you can look at every name before you buy, but address and phone number fields are hidden," said Frank Ingari, vice president of Lotus' emerging markets group.

Once a user chooses a list, a dialog box pops up to tell the user how many names are being bought, and how many are left, Ingari said. Users can also generate labels, perform analyses, or dump names into a database.

Beta testers said they like being able to preview data and screen out inappropriate firms before selecting (and buying) data. For example, Marketplace is less time consuming and potentially less expensive than relying on traditional list brokers, beta testers said.

"Brokers are big bucks, and their lists are riddled with duplicates and companies I'm not interested in," said beta tester Greg Amstutz, president of Career One USA, a Tempe, Arizona, recruitment firm. Amstutz uses Marketplace to screen companies by downloading data into CAT III, a Chang Labs contact management package, and generating custom reports. "When you focus your effort this way, you get a more highly qualified candidate response," Amstutz said.

Another beta test site, Opinion Dynamics, an environmental research and consulting firm in Cambridge, Massachusetts, dumps data from Marketplace into Microsoft Works to generate direct-mail surveys, said John Gorman, president.

A follow-on product with data on 80 million U.S. households is scheduled to ship later this year, Lotus said.

Marketplace is available only on the Mac, and requires a system with 4 megabytes of RAM, a hard disk, and an Apple CD SC, CD ROM or compatible. Lotus has indicated it may move Marketplace to other platforms, but Ingari would not comment on a time frame.

Data Shaper 1.2 from Else Ware Eases File Import in Pagemaker

By Tom Quinlan

Else Ware Corp. has introduced Version 1.2 of its Data Shaper import filter, specifically developed to run with Pagemaker 4.0 from Aldus Corp.

Data Shaper, which was originally introduced in 1989, is designed to facilitate the transfer of database files directly into a Pagemaker document.

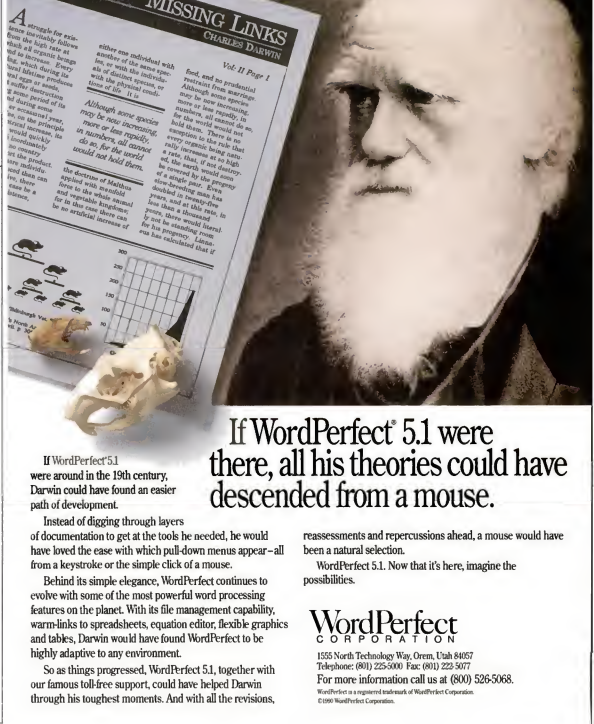
With the new functions of the recent upgrade, Data Shaper users can take advantage of the improvements introduced by Aldus in Pagemaker 4.0, including the capability to automatically generate an index and a table of contents within the Pagemaker document, according to Else Ware officials.

The $179 import filter, which transfers Macintosh database text fields directly into a Pagemaker document, can also locate a graphic image developed or residing within a database. It can search out data within Hypercard stacks, and can tell Pagemaker to retrieve the graphic file, although it cannot directly transfer graphics.

Other features offered with Data Shaper include the capability to transfer database files that were originally developed on a DOS-based system, but which now reside on a Macintosh, into Pagemaker documents. It also provides a barcode font, Zip Bars, which allows users to add ZIP codes in a bar-code format to envelopes or labels.

Currently, Data Shaper can retrieve information from virtually all Macintosh databases but can only be used in conjunction with the Macintosh version of Pagemaker.

Else Ware Corp., 713 N.E. Northlake Way, Seattle, WA 98105; (206) 547-9623.



If WordPerfect 5.1 were around in the 19th century, Darwin could have found an easier path of development.

Instead of digging through layers of documentation to get at the tools he needed, he would have loved the ease with which pull-down menus appear–all from a keystroke or the simple click of a mouse.

Behind its simple elegance, WordPerfect continues to evolve with some of the most powerful word processing features on the planet. With its file management capability, warm-links to spreadsheets, equation editor, flexible graphics and tables, Darwin would have found WordPerfect to be highly adaptive to any environment.

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NEWS WIRE

● LAWSUITS

MOTOROLA, HITACHI SETTLE SUIT. Motorola Inc. and Hitachi Ltd. settled their intellectual property and technology disputes regarding Hitachi's H/8 and H/16 microcontrollers and Motorola's 68030 and 88000 microprocessors. Terms of the settlement were not disclosed, but Motorola has said it will file motions with the federal court in Texas requesting that all pending cases involving Hitachi's microcontrollers and chips be dismissed.

ADAPTEC SUES CALIFORNIA MICRO DEVICES. Adaptec has filed suit against California Micro Devices, seeking return of Adaptec's chip components. As a foundry for Adaptec, CMD had access to Adaptec intellectual property used in developing tooling for the manufacture of ASICs. When CMD did not complete the projects, Adaptec said it canceled engineering agreements and called for the return of its property but without results.

● PERSONNEL CHANGES

RYAN NAMED PRESIDENT OF ON TECHNOLOGY. On Technology, Mitch Kapor's start-up, recently announced that Conall Ryan will succeed Kapor as president. Before joining the company, Ryan was marketing manager for Next Computer and a product manager at Lotus Development Corp. Last April, the company shipped its first product, a file management utility for the Macintosh called On Location. Kapor will remain as chairman of the Cambridge, Massachusetts-based company.

HP EXECUTIVE NAMED PRESIDENT, CEO OF OCTEL. Longtime Hewlett-Packard Co. executive Douglas C. Chance has joined the staff of Milpitas, California-based Octel Communications Corp. as president and CEO. Chance, formerly HP's executive vice president of its networked systems sector, replaces Octel cofounder Robert Cohn, who remains as chairman of the board.

● EXPANSION

SOFT WAREHOUSE TO OPEN MAIL-ORDER SUBSIDIARY. Soft Warehouse, the Dallas-based chain of 13 computer superstores, is opening a mail-order subsidiary. Called Comp USA, it is intended to broaden the company's reach into areas too small to support a retail location.

■ MARKETING TREND

Superstores Redefine Computer Reselling

Corporations Enticed by Pricing, Availability

BY DAVID COURSEY

When accountant Steve Crews needs PC add-ons, cables, and software, his reaction is automatic.

"We just tell our firm administrator what we need and she goes up to Soft Warehouse and gets it," Crews said. "We like it because it has good prices on stuff we need."

"I recommend it to everybody. When my sister comes in from France every year, we go to Soft Warehouse and get what she needs," said Crews, who helps manage a 45-node LAN at Lane, Gorman, Trubitt & Co., a Dallas accounting firm.

Superstores: Supermarkets of the PC Industry

Company Name	Number of Locations
Computer Expo Inc. Houston, TX	1
The Computer Store of Kentucky Inc. Louisville, KY	1
J&R Computer World New York, NY	1
Elek-Tek Inc. Skokie, IL	2
Fry's Electronics Palo Alto, CA	3
Micro Center Columbus, OH	3
Soft Warehouse Dallas, TX	13
Computer Factory Elmsford, NY	1 (announced)
Compusadd Austin, TX	1 (announced)

SOURCE: MERRIN INFO. SERVICES

Crews' reaction is typical among customers of the hometown superstore, who queue up at lunchtime at the supermarket-style checkout lines, shopping carts filled with low-cost PCs and discounted software.

Most are corporate and business customers, who account for 80 percent of the store's revenue, said Nathan Morton, the former Home Depot and Target Stores executive who 16 months ago became Soft Warehouse's president.

"Our appeal to corporations is pricing and availability," said Morton, who believes computer superstores succeed by creating the discount store atmosphere customers already know.

A Texas phenomenon since the mid-1980s, in the past two years Soft Warehouse has gone national. Its 13 stores make it the largest superstore chain and put it at the forefront of what some see as the most fundamental change in computer reselling since the invention of the PC.

"Superstores are the answer to the dreams of technically literate computer users," said JoeAnn Stahel, president of Dallas-based Storeboard/Computer Intelligence. "They offer everything most people need at 30 to 80 percent off list price, and it's available straight off the shelf."

Dubbed "category killers," superstores pose a threat to traditional computer dealers what supermarkets did to corner groceries. Market analyst Seymour Merrin, president of Merrin Information Services, in Palo Alto, California, predicts superstores, which number 24 today, will grow to 82 by the end of 1991.

In that time, Soft Warehouse plans to open 20 more locations. Other players include Fry's Electronics, with three San Francisco-area stores; Micro Center, in Columbus, Ohio, and Atlanta; and Elek-Tek Inc. in Chicago. Chains like The Computer Factory and Inacomp are expected to open superstores of their own.

"In two years there will be a superstore in every major market, and within four years they'll be in every market of any size," Merrin predicted.

Merrin estimates the average superstore garners $50 million per year, with after-tax profits between 1 and 2 percent — equal to other computer retailers. But because they can dominate a market, Merrin said other resellers will retrench to survive and some will go bankrupt.

But not everyone is wild about superstores. Some customers complain about long lines, poor service, and the difficulty of getting technical support.

Customers have accepted that Soft Warehouse "isn't the old computer boutique where people sat down with you for two hours and took you through 15 or 20 applications," Morton said.

While the stores offer hardware support and sell on-site service policies, the large variety of software means that support has to come from publishers. Still, Morton believes because superstores are customer driven, manufacturers and software developers will end up providing better products and prices. □


LES WOLLAM

The discount store aura accounts for Soft Warehouse's success, said president Nathan Morton.

Ex-Norton Exec Takes Over as CEO at Wordstar

BY PATRICIA J. PANE

NOVATO, CA — Wordstar International Inc. has appointed Ronald S. Posner as the company's chief executive officer in what some view as a move to regain its lost glory.

Posner joins the company after a 16-month stint as president and CEO of Peter Norton Computing Inc., now a division of Symantec Corp. He said his initial actions will be to augment Wordstar's marketing staff and then move toward expanding its product line. "I believe Wordstar has a lot of potential that has not been realized," Posner said. "It has an excellent worldwide distribution, good revenue, cash in the bank, and a group of 260 people."

"I plan to bring new products that we can put into the existing worldwide distribution program, products aimed at office environments that work with the Wordstar installed base and with any word processor," Posner said.

With Posner at the helm, Wordstar has the chance to regain some of its former fame and fortune, said John Murphy, director of special projects at Wohl Associates, in Bala Cynwyd, Pennsylvania. The first step is to revamp the Wordstar product by adding bells and whistles, and then develop or acquire complementary products, he said.

"A lot of one-type product companies are divesting into a broader spectrum of add-on products or even different types of products," said John Murphy. Posner can guide the company toward the next generation of word processing products, he added.

Product and company acquisitions are in the offing, Posner said. He declined to disclose specific details, saying only that the focus is on document management and image processing.

Judge Rules AMD Can Announce Chips But Can't Call Them 386s

BY PATRICIA J. PANE

SAN JOSE, CA — A federal court judge here ruled recently that Advanced Micro Devices Inc. cannot call its expected 386 clone a "386" — for now.

The ruling resulted from a case of mistaken identity concerning Intel Corp.'s continuing battle with AMD over whether Intel has exclusive rights to the 80386 microprocessor. The dispute heated up again after an Intel employee mistakenly received a package addressed to an AMD employee of the same name.

The AMD documents mistakenly received by the Intel employee described AMD's plans for a 386 clone, which it had designated as the AM386.

The affair sent Intel scrambling to court in search of a temporary injunction and restraining order on the unannounced chip.

Although no formal announcement has been made, AMD has since acknowledged that it has a working 32-bit microprocessor device in the hands of some of its customers.

U.S. District Judge William Ingram ruled that AMD could announce its product but not designate it with the trademark term "386." Rather than rule on the merits of the case immediately, Ingram issued the order and scheduled a full hearing for October 15, according to both companies.

Meanwhile, AMD expects a decision soon on Intel's copyright infringement case against AMD's 80287 chip, at which time AMD may formally announce its 386-like chip. Also pending is an AMD motion for dismissal concerning a 1976 license agreement, which AMD claims allows it to copy and distribute Intel microcode. That hearing is set for October 22.

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HARDWARE HUMOR. An informed source has it, that at a recent trade show in Los Angeles, a group of EISA engineers were seen getting on the wrong bus.

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STATE OF THE INDUSTRY ■ By Rachel Parker

Executives Act Like the Industry's Brash Adolescence Is Now Over



Say goodbye to the colorful, free-wheeling days of yore; computer companies are today toeing a more conservative line in the name of consumer responsiveness.

You know that times have changed when Apple computer — one of the industry's most self-styled unconventional companies — decides that it is time to strike a new attitude. While the old Apple prided itself on its "noncorporate" culture and adherence to design principles, the new Apple is decidedly more humble.

The new attitude starts at the top. Early this month, Apple's top executives invited members of the media to a briefing, discussing the New Apple. It became a kind of public mea culpa. Chairman John Sculley acknowledged that the company had made mistakes; Mike Spindler, the new president of Apple U.S.A., said that some products — notably the Portable — had missed their mark. And going forward, things would be different.

While the executives tended to answer specific questions with vague replies, they repeatedly said that many of the principles that the company had held as near-truths may be reconsidered. Nothing, they said, was sacred any longer. That goes for direct marketing to corporations, pricing and margin relationships, and product positioning.

What the executives were trying to convey is that Apple will be more responsive to their customers — rather than trying to blindly adhere to corporate dogma. Design criteria would follow the needs and desires of customers — not those of the purists in the lab or design studios.

This tone extends all the way down to the images broadcast on television. The new ads return to more conservative corporate tone. The ads show the new Macs in applications settings, — in schools, home offices, and small businesses. Throughout the campaign runs a theme that Macs don't cost an arm and a leg any more.

And, though while Apple still takes a few friendly jabs at IBM, the messages steer clear of offending anyone. A far cry from the 1984 lemmings ad.

Apple's virtual rebirth and humbling is not unique to the company. The industry overall — once known for its flamboyance — is trying to adopt a new persona. It's a more responsible image, one in which company executives are accountable for their companies' products and the messages conveyed by those products.

Even Philippe Kahn, who built a reputation for being the PC industry's bad boy, has left his wild ways in recent years. Not too long ago, the head of Borland could be counted on for some controversial and witty statement about virtually any of the industry's events. But what did he say following the IBM/Microsoft realignment of development resources? "Relationships are changing; it is going to create a new topology." Well, sure.

Perhaps one of the most successful makeovers was Lotus Development's Jim Manzi. Once it became obvious that Lotus was struggling with the multitude of new products promised by Manzi, the president began to shed his brash, youthfully arrogant attitude like so much old skin. True, the company sued its competitors, but Manzi has been careful not to allow himself to be portrayed as belligerent. Even after winning the case against Paperback Software, Manzi resisted any temptation to gloat.

Why have formerly colorful compa-

Blue suits and mild-mannered advertising should not be confused with concern for customers.

nies and executives taken on such a conservative tone? One could say that the industry has gone through a turbulent adolescence and is now more responsible. Executives realize now that it is the quality of their products, not their creators' bombast, that persuade customers to buy one package over another.

Plus, whereas the industry used to be dominated by creative and sometimes careless individuals, business people are running the show now. So buyers can count on more thoughtfully designed products, less glamour, and more substance.

At least, that is how the PR officials would put it.

Certainly, the new conservative tone will play well with many customers — including shareholders. But before we pat any execs on the back for a successful maturation process, let's see just how far they will go to show their commitment to customers.

It is unclear whether Apple officials really have killed those sacred cows. For example, will Apple executives change the long-standing proprietary approach to its ROM technology? The strategy has enabled Apple to maintain very comfortable margins over the years.

That goes for the whole industry, too. Today's messages certainly sound less alarming than some of the statements released in years past. But blue suits, mild-mannered advertising, and even humble statements should not be confused with real concern for customers. After all, business people are just as interested in maintaining margins and sales volume as the creative hotshot.

Rachel Parker is InfoWorld*'s executive editor of news. Comments are welcome via MCI Mail (I.D. number 340-4371, or InfoWorld) or through traditional mail.*

TECH STREET ■ By John Gantz

Repository Manager Promotes MIS Control of Corporate Data



It takes some time to build a universe. A year ago (October 2, 1989) we talked about the announcement of IBM's Repository Manager and how it might affect personal computer users, micro systems managers, and corporate buyers. Since then, IBM began shipping the first release of Repository Manager to pioneering users and announced that Version 2.0 will come sometime in 1991.

To refresh your memory, the Repository is a mainframe-based software product — it's officially an IBM DB2 application — that keeps track of software subroutines, application specifications, data constructs, and corporate information systems models. Its initial purpose in life is to serve as the integrating glue — through its record of data types and inventory management of software subroutines at use in and around an enterprise — between disparate computer-aided software engineering (CASE) products, many of which will be offered by non-IBM companies.

A secondary role for the Repository will be to store information about users (password authorizations, transaction history, etc.), devices (addresses, configurations, etc.), and systems (routing tables, security levels, data descriptions, etc.) in an enterprise. The Repository has been described as the "Big Data Dictionary in the Sky."

Indeed, so far the Repository remains mostly in the sky. Early users report that its functionality is about 25 percent what it ought to be, even for the first release, and that it's pricey and slow, with response times running into fractions of a minute rather than fractions of a second. And now that more is known about Repository and IBM's proposed integrated application development environment, AD/Cycle, of which the Repository is an integral part, it's clear that for even leading-edge companies building a full-blown organizational repository will take years, if not decades. To do it right requires a dedication to CASE that few users yet have, and a long-term plan to convert older applications to the CASE model.

But it will come, it will come.

It will come because the stakes for IBM and its true-blue MIS customers are too high. The Repository is the cornerstone to an enterprisewide approach to applications development, which is the cornerstone to enterprisewide computing, which is the cornerstone to career longevity for IBM's loyal buyers and for IBM.

Enterprisewide applications development is also, incidentally, the cornerstone of demand for enterprisewide client/server networks, in which, my friends, our trusty PCs and Macs are to be the ubiquitous clients. And we are to be the operators.

In the era of networked computing and cooperative processing — where mainframes are servers on our PC nets — the ability to develop enterprisewide applications that run on micros will be critical. Giant corporations have been puzzling over this one for years — striking a balance between dispersed computing and the development of enterprisewide applications that use corporate data. The Repository, and the integrated CASE environment AD/Cycle, offers centralized IS departments the ultimate instrument of control over far-flung information systems. Order onto chaos.

Do we need to know these things? Aren't AD/Cycle and the Repository really mainframe computing tools? Aren't they really aimed at those 70 billion lines of Cobol in use? Do they really have anything to do with micro-computers?

You bet. Remember back. We live today in the aftermath of what was truly a revolution — the emancipation of end-users from the central computing control embodied by terminal-based computing. It was war. MIS departments scrambled to control PC purchasing, and systems vendors waited until there was a multi-billion dollar market in place before timidly offering products. It took a while, but IS managers finally regained some control of computing resources by offering selected systems and software support, and learning about PCs themselves. But doing so took a toll. They also had to

The Repository is IBM's cornerstone to enterprisewide applications development.

embrace the technology. What's the biggest trend in IS today? Downsizing — applications onto smaller platforms, departments onto smaller payrolls.

But the professional IS folks are still the corporate data centurions. If we want access, we'll have to pay. We'll have to follow their procedures, be the remote operators in their enterprisewide cooperative computing applications, ante information into the Repository, and live within the limits of their system flexibility and application development backlog. In the vision of IBM and its data center customers, an integrated — and highly automated — application development environment will allow organizations to gain much tighter control over what is clearly a precious resource: data.

Where does most of that data now lie? In the field. On our floppy disks and hard drives. The Repository builders would like first to catalog all that data, then control access to it.

John Gantz is editor of the Tech Street Journal*, a newsletter on the high-tech stock market and business performance. The views expressed are his own.*

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IBM Personal System/2® s with Micro Channel™ on desks everywhere are starting to exhibit some pretty wild and wonderful tendencies. They're creating incredible on-screen presentations. Interactive tutorials with full-motion video and stereo sound. Graphics, text and animation in harmonious coexistence. What makes it all possible is the multimedia capability of the IBM PS/2® with Micro Channel.



Micro Channel Makes It Look Easy.

The PS/2 itself is designed to put multimedia applications to their best use. Micro Channel has always given the PS/2 extremely fast data rates and better multitasking capabilities. But in multimedia it really gets a chance to shine. The multilane highway design of Micro Channel Architecture is perfect for processing complex multimedia applications. Most conventional PCs just don't have the power or the data paths to do it at all. Plus, Micro Channel in the PS/2 lets you use the new IBM CD-ROM that gives you the storage equivalent of over 400 diskettes on a single CD so you can have access to all kinds of data-intensive material like clip art and digital stereo sound.



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PERSPECTIVES

Enterprise Computing

Corporations are determined to make their hardware and software work together in a cohesive strategy, and computer vendors are under pressure to help them.

BY ED FOSTER

It's as if the same idea occurred simultaneously to corporate boards all across the country.

The idea is called enterprise computing, and at first glance it seems simple enough. A company makes the decision to develop a strategy that will maximize the competitive advantages it can gain from all of its computing resources — from mainframes to PCs — throughout the organization.

But as company after company commits to enterprisewide or strategic computing, the implications for computing professionals and vendors alike are growing rapidly. For those prepared to ride the wave, the opportunities are boundless. Those prone to resist could easily be overwhelmed.

Enterprise computing can mean quite different things from one company to the next, and it is not limited in the technical and managerial approaches it can encompass. While in many companies it provides a framework for such trends as distributed processing, internetworking, downsizing, etc., it embraces older, more mature technologies as well. A company that sets out to make the best use of its computing resources rarely finds that throwing everything out the door and starting from scratch is the most efficient policy.

Far more important than the types of technology employed in an enterprise strategy is the kind of people that must be involved in designing and implementing it. Naturally, a company must include all of its technical experts in enterprise projects, from PC support personnel and LAN managers to MIS/DP and telecommunications specialists. But that's not enough, because an enterprise strategy will work only as well as it dovetails with the way a company does its business. Only by incorporating users' knowledge of the company's business and how they do their work can strategic computing really be accomplished.

THE DECISION PROCESS. Those who have helped their companies take the first step toward implementing an enterprisewide strategy all emphasize that the entire organization must be involved in making it work. That may, in fact, be the one common thread found from case to case, because enterprise computing probably can be best defined not in terms of what a company does with its computers, but by the approach it takes to making decisions about its computing. Beyond that, case studies reveal that a multitude of approaches are possible under the enterprise computing banner.

GE Capital Fleet Services in Eden Prairie, Minnesota, is a leading firm in the fleet-vehicle leasing business — the result of several acquisitions made by GE over the last few years. In an effort to distance itself from the competition, the new management team decided in 1988 to make a major investment in developing what it called its "Systems of the 90s" architecture, to increase the number and quality of value-added services they could supply to their customers. "We were trying to get strategic systems to push us out into the value chain," said Jim Rogers, GE Capital Fleet Services president. "The whole process is oriented around making us faster and easier to use for the customer."

Right off the bat, GE Fleet Services decided to start from scratch in developing its system rather than build around the Honeywell systems it had inherited in the acquisition. This unusual decision led them to look for a computer supplier that could be a technology partner, supplying overall design help as well as a variety of hardware. "Taking the entire information system as it existed and throwing it away put us heavily into risk abatement," said Jay Dinwoodie, senior vice president of systems applications for GE. "We wanted to off-load some risk on our technology partner."

GE Fleet Services thus became one of the first major customers to commit to IBM's SAA (Strategic Applications Architecture), the multiplatform architecture IBM has devised with enterprisewide computing in mind. A three-tiered architecture was chosen, using IBM PS/2 Model 70s running OS/2 as the base workstation, IBM AS/400 as the middle tier, and an IBM 3090 mainframe at corporate headquarters in Stamford, Connecticut, as the ultimate database server. The company began designing a variety of applications to serve different functions within the company, many of them with different modules running under OS/2 on the workstations in Minneapolis and on the mainframe in Connecticut. The company has brought some 30 major applications in diverse areas into full-time use, making it one of the first showcases for IBM's SAA.

SAA and Office Vision, IBM's SAA-compliant office automation software, have grabbed a large share of mind in the enterprise software market, but IBM is hardly the only vendor to jump on the bandwagon with a multiplatform architecture and/or office automation software environment. DEC has a similar offering with its NAS (Network Application Services) architecture and All-in-One integrated office software, and the list of other participants now includes AT&T, Hewlett-Packard Co., NCR, and Xerox.

SOLUTION TO SOLUTION. Few businesses have made the type of commitment to such schemes that GE Fleet Services has made to SAA, but even those who are still uncommitted often find such architectures help their vendor relations. "The nice



TOM MURPHY

thing about SAA or DEC's NAS is it gives us a way to talk to that vendor about what its intentions are," said John Chapman, senior consultant in planning and architecture at Amoco Corp. "It means better and better opportunities to get connectivity, not only at the bardware level, but at the application level. A lot of them, especially the big players, have finally figured out that the private sector is becoming more like the government has traditionally been, in that we're looking at whether a solution will hook up to the other solutions we already have."

Amoco is taking a process-oriented approach to developing its global architecture. "What we're doing right now is trying to come up with some standard structures and definitions for what we want the Amoco computing architecture to mean," Chapman said. "The idea is to try to describe all of Amoco computing as a single set of protocols and interfaces. We think we're making big strides just to get everybody to use the same terms and definitions.

"The next thing we'd like to do is to get some common directions for how we're going to use all the technology, particularly in areas like distributed data, or using satellites to tie into our worldwide backbone," Chapman said. Chapman doesn't believe that Amoco's enterprise strategy should dictate technology choices so much as it should help make the choices easier. "In a company as diverse as ours, whatever technology you pick is probably appropriate for something," he said.

THE SHRINKING COMPUTER. Amoco has already made major efforts in networking its sites both domestically and internationally, and also has moved several applications from their larger systems to PC LANs. That downsizing process has resulted in the elimination of a number of expensive "glass house" MIS/DP data centers for Amoco. "We've gone from 11 major glass-house type installations a few years ago down to two domestic and two foreign installations," Chapman said. The consolidation of resources helps avoid redundancy. At the same time, the company is trying to decentralize many applications, locating them closer to the actual line of business that uses them. "One of the things about doing that architecture work that we're doing now, is by the time we're done, we'll have a good idea of what equipment we've got in different areas and what we're doing with it."

Because enterprise computing is geared at making the most efficient use of computing resources, it often entailing downsizing applications from larger systems, the client/server model is an approach that is becoming central to many organizations' strategies. NASA has recently completed a series of prototyping exercises designed to see if it could move some of its major applications to a PC-based client/server system.

"The goals were to off-load the mainframe, and in addition to provide experienced users with more tools," said Steve Prejean, manager of information technologies at Houston-based CGS Control Systems, Inc. (GCS), whicb contracted with NASA to do the prototypes. One of the main applications GCS prototyped was an in-flight anomalies application used to track all unexpected incidents in the course of a shuttle flight. Gupta's SQL Base and SQL Windows were used for developing the LAN-based application. "We worked to download the raw information off the mainframe and process it on the LAN to the workstations," Prejean said. "The importance of going through the process is it's very typical of many applications that NASA goes through, with very detailed record keeping that must be accessed later by a variety of specialists for analysis."

LOCAL TOOLS. NASA will evaluate the results of the prototype before making any decision about its final choice of architecture, but Prejean feels the LAN-based application demonstrated some definite advantages to the existing mainframe-based application. "The main advantage is letting the users be able to access the tools that are readily available for use on the PC," he said. "Having a PC word processor, for example, instead of a mainframe-type line editor, is a plus. The users aren't just doing data entry — they have control to access the data, analyze it and create reports with a variety of tools, statistical packages, data correlation tools, etc."

In testing the application, however, Prejean noted that one expected benefit from moving to a PC-based application proved not to be valid. "It was thought that some potential users we have who at this point only deal with the hard-copy reports would be more willing to use the computer when we gave them an easy-to-use environment like Windows," Prejean said. In fact, the majority of users who had traditionally spurned the computers continued to do so. "Ease of use turned out not to be as big a driver as we first thought, because most of them still just wanted to see the final report and weren't interested in interfacing with the computer no matter how easy it was to use," he said.

Enterprise strategies that make assumptions about what users will and will not do, without consulting the users, are almost certainly doomed to fail. "One of the things that I think will be most challenging to us is to change people's habits," said Bruce Johnson, director of support services for Sullivan and Cromwell in New York. "The technology is there, but if people aren't willing to change the way they work — in something as simple as the way they name a document, for example — you've got a problem. The big challenge of enterprise computing is to convince people to work as an enterprise."

As most large corporations today encourage a high degree of decentralization, a true enterprisewide system cannot simply be imposed from the top without meeting major resistance. "It's a very touchy issue," said Virginia Johnson, manager and team leader supporting staffing development for corporate human resource systems at Hughes Aircraft. Johnson is now in the process of designing an application tracking system for the whole company.

YOUR DATA, OUR DATA. Getting the various divisions within a corporation to buy off on an enterprisewide application is not a simple task. The groups are likely to have very legitimate concerns about their ownership of data, costs, and security vs. other groups. "If they're paying for a full-page ad to advertise a position, they are not going to be too happy about sharing the results of that ad with other groups," Johnson said. "And, of course, you run into other political issues, such as the not-invented-here syndrome, resistance to change, and the comfort level people have with the systems they've been using."

Front Ends Mark Tip of Client/Server Iceberg

Front ends represent the top of the client/server food chain. They are the finished applications or sets of applications that make access from PC clients to corporate data servers possible with a minimum of effort.

Not all vendors are comfortable with the term front end; alternatives such as "data source integrator" or "knowledge navigator" are sure to flourish.

For front ends to work, a whole series of client/server technologies must be present and working. The client system runs the user's application while making the connections to server processes as seamless and transparent as possible. The server itself must generally have an open and published application programming interface (API) that permits PC applications developers to easily map their data definition and manipulation commands to the remote data source.

Before client/server computing, PC applications had to be aware of the physical location of data, its structure, and its properties. Every time the structure of remote data or the applications that governed it were changed, the PC application had to be modified at great time and expense.

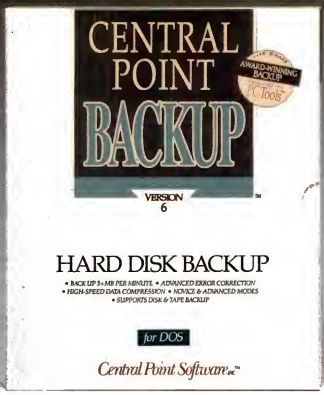
SQL, or Structured Query Language, has so far been a key component of client/server solutions, but ultimately the client/server world will embrace alternative methods as well. Non-SQL client/server databases exist, as do other kinds of client/server systems, including text and image processing, expert systems, and object-oriented systems, where relational databases offer incomplete solutions.

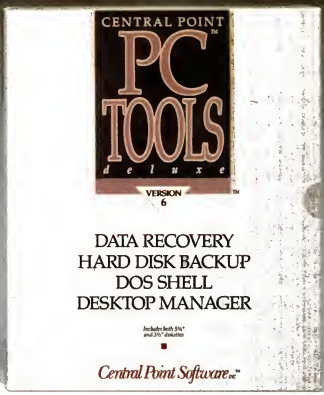
The promise of client/server computing, still only partially fulfilled, is to make applications work independent of data, locations, or structural considerations. The front ends listed here represent the best the industry has been able to offer so far, but many more are in development.

— Scott Mace

Available Client/Server Front Ends

Front End	Publisher	Server	Type
G-run	Analytical Software	Oracle	Presentation graphics
Dbase III Plus	Ashton-Tate	SQL Server OS/2	SQL link
Framework III	Ashton-Tate	SQL Server OS/2	Integrated
Paradox	Borland	IBM EE DB	DBMS
Paradox	Borland	Oracle	DBMS
Paradox	Borland	SQL Server OS/2	DBMS
Forest & Trees	Channel Computing	SQL Server OS/2	Query tool
DBMS/Copy	Conceptual Software	Oracle	Tebie mover
DBMS/Copy Plus	Conceptual Software	Oracle	Tebie mover & 3GL
Dataease SQL	Dataease	SQL Server OS/2	DBMS
SQL Server Tool	Datawiz	SQL Server OS/2	C link library
Capture	Datawiz	SQL Server OS/2	Tebie mover
SQL Windows 1.1	Gupta	Oracle	4GL
SQL Windows 1.1	Gupta	SQL-Base	4GL
Query Manager	IBM	IBM EE DB	Query Tool
PC/Focus DS/2	Info Builders	SQL Server DS/2	4GL
Ingres Tools for DOS	Ingres	Ingres	4GL
Applications Mgr.	Intelligent Env.	IBM EE DB	4GL
KSE Report Designer	KSE Inc.	Oracle	4GL
Windows SQL Toolkit	LOS Consulting	Oracle Unix/Xenix	C link library
1-2-3, Release 2.X	Lotus	SQL Server OS/2	Spreadsheet
1-2-3, Release 2.X	Lotus	SQL-Base	Spreadsheet
1-2-3, Release 3.X	Lotus	Netware SQL	Spreadsheet
1-2-3, Release 3.X	Lotus	SQL Server DS/2	Spreadsheet
Wordmerc Composer	Marc Software	Oracle Unix	Word processor
Form System	Megahaus	Oracle	Forms management
Cobol	Microfocus	IBM EE DB	3GL
Excel	Microsoft	SQL Server OS/2	Spreadsheet
Excel	Microsoft	SQL-Base	Spreadsheet
Excel	Microsoft	Oracle	Spreadsheet
Clipper	Nantucket	SQL-Base	DBMS compiler
Nexpert Object	Neuron Data	Oracle	Expert system
VP-Expert/SQL	Paperback	SQL-Base	Expert system
Q+E	Pioneer Software	SQL Server OS/2	Query tool
Progress	Progress Software	Progress	DBMS
Advanced Revelation 2.0	Revelation	SQL Server OS/2	DBMS
Access SQL	Software Products	SQL-Base	DBMS
Easy SQR	SQL Solutions	Oracle	4GL
SQL Commander	Strategic Tech.	SQL-Base	Query/entry
SQL Commander/W	Strategic Tech.	SQL Server OS/2	Query/entry
SQL Commander/W	Strategic Tech.	SQL-Base	Query/entry
SQL File 1.1	Vinzant	SQL Server OS/2	Query/entry
SQL File 1.1	Vinzant	Netware SQL	Query/entry
XDB C	XDB	XDB	3GL
XDB Forms	XDB	XDB	Forms management
XDB Graph	XDB	XDB	Presentation graphics
XDB-SQL	XDB	XDB	4GL
ZIM	Zanthe	IBM EE DB	4GL

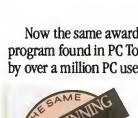




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Mouse support, on-screen media and time estimates, pull-down menus, and context-sensitive help make Central Point Backup a snap to learn and use. Select groups of files automatically based on file extension, date or other criteria; select individual files from our tree-oriented display; or simply have Central Point Backup append every file that has changed to the last disk in your backup set.

BACKUP TIME

	InfoWorld	NSTL
Central Point Backup	7:00	2:03
Fastback	9:17	2:43

InfoWorld tests on an Intelligent Data Systems PC-286 AT. National Software Testing Laboratories used a Compaq Deskpro 286s.

Other labor-savers include a built-in SCHEDULER that lets you do backups even while you're asleep. And a COMPRESS option reduces disk or tape usage by up to 60%.



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Johnson said.

The solution to the people issues that most companies are adopting is the standards committee. The basic idea is to get everyone involved in the decisions the company is making about its future computing strategy. Everyone from the corporate board to the data entry clerks can and should be included in the discussions that pertain to their job responsibilities.

At Hughes, Johnson is forming what she calls an application team to help formulate the plan for the enterprisewide application tracking system. "The team helps sell the concept out there in the company," she said. Participants include MIS staff, those with human resource functions in the various groups, as well as systems people in the groups charged with supporting human resources.

"You include all the stakeholders," Johnson said. "It's an extremely political endeavor, in that there are so many issues that don't easily surface, so you really have to work to get a buy into this kind of concept. It's a matter of bridging that corporate group culture, building on trust and leadership," she said.

At GE Fleet Services, the company held "brainstorm sessions" in which executive staff, systems personnel, and users were all brought in on discussions of the applications they would be involved in working with, according to Dinwoodie. The meetings often lasted for days, but little of the time dealt directly with technology. "What we were doing was going through the business, trying to understand how we were doing things at that time, and how we would like to do them in the future," Dinwoodie said. In examining ways GE could improve its systems through technology, the meetings often identified improvements that could be made without waiting for any computer assistance. "By going through this process, we had a positive impact before we wrote one line of code," he said.

ENTERPRISE OBSTACLES. While there is no question that people are the biggest issue in implementing enterprise strategies, the technical obstacles are not to be taken lightly. With its emphasis on linking diverse environments, enterprise comput-

Proprietary Hardware Still Dominates Multiplatform Strategies

The era of open systems in office automation strategies is not nearly upon us, even though each of the major players has staked a claim with strategic offerings that purport to be open.

Open, for IBM, means that the server software is scheduled to run on every Systems Application Architecture (SAA) platform that IBM makes. In DEC's case, it means a VAX running VMS, and maybe someday an Ultrix or OS/2 server, but not by any day currently scheduled.

In Hewlett-Packard Co.'s case, open currently means using an HP 3000 as a server; in Data General's case, an Eclipse; and with Xerox it is a Sun Sparc machine.

From the server point of view, openness will begin in the fourth quarter, when HP delivers OS/2 server software for its New Wave Office products. NCR will deliver its product in March. AT&T has also begun with some level of openness by using Unix System V/386, which is available for any Intel 386/486 based system, as its server platform.

On the client side of network office automation, open in most cases means opened up to DOS machines running a version of Microsoft Windows. Digital Equipment Corp. soon will allow, as HP now does, Macintoshes as clients on the network, while DEC takes care of DOS character cell clients and VT terminals.

AT&T and Xerox have laid bets on the Unix side of the fence rather than on OS/2, whereas NCR is hedging its bets by developing for both OS/2 and Unix.

Beyond the differences of platforms and the ship dates, however, a single, clear message is being sent to corporate buyers: All of the major vendors will supply extensive network services based upon the client/server model, and a huge wave of such products will hit the market in 1991.

Although each product — IBM's Office Vision, DEC's All-in-One, HP's New Wave Office, AT&T's Rhapsody, NCR's Cooperation, Xerox's Global View, and Data General's CEO Object Office — is clearly a piece of office automation, none is the classic integrated office automation package of the past, with a word processor here, a spreadsheet there, and a communications package over here.

Instead, these are the glue services that act as a background for applications already familiar to the user, but in versions that make them work with other vendors' software.

All of the offerings are centered around a consistent graphical user interface through all applications, including third-party applications. They also all concentrate on providing sophisticated electronic mail services, capable of sending compound documents containing text, graphics, and images (although not yet sound and real-time video) as easily as two users on a LAN can now send ASCII text.

Moreover, all of the vendors recognize the importance of, as DEC puts it, "integrating the enterprise." In practical terms, it means establishing a great deal of internetworking, so that new E-mail services on LANs can reach Profs users on mainframes, or DEC-Net users on VAX systems. It means coming up with a compound document architecture, so that mixed-object messages (including spreadsheet contents from Node A, a word processing document incorporating them from Node B, and editing from Node C) can all be sent as E-mail over a network without having to make copies of all of the separate document files.

Besides graphical desktops, sophisticated E-mail, and some forms of dynamic data exchange, each of these environments contains a component that attempts to link the user into databases located elsewhere on the LAN, or in larger systems bridged to the LAN.

In every case, the theories are great. But the real applications that are adapted for these environments won't be plentiful until well into 1991.

— Martin Marshall

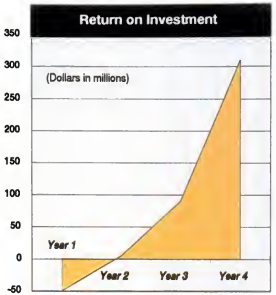
Multiplatform Office Automation Strategies

Company	Product	Client Platform	Server Platform	Availability
IBM Office Vision	Release 1.1 (E-mail, address book, file systems, telephony)	DOS (through DOS requester) OS/2 Extended Edition	AS/400, VM, MVS OS/2 Extended Edition	Now
	Release 2 Calendar, document library	DOS (Through OOS requester) OS/2 Extended Edition	VM, OS/2 LAN Server MVS AS/400	Fourth quarter, 1990 First quarter, 1991 Sometime in 1991
DEC All-In-One	Phase 1	DOS DEC-Windows	VMS	Now
	Phase II	DOS OEC-Windows VAX Mac Oesktop Windows 3.0	VMS Ultrix OS/2	Now First quarter, 1991 Second quarter, 1991 No release date No release date
HP New Wave Office	Information access	MPE, HP-UX, DOS (Windows 3.0)	MPE (HP 3000) HP-UX OS/2 Standard Edition	Now Fourth quarter, 1990
	Information distribution (E-mail)	MPE, HP-UX DOS (via Advanced Link) Mac (via Advanced Link)	MPE HP-UX (HP Open Mail)	Now
	Resource sharing	HP-UX, OOS/Windows 3.0 OS/2 Standard Edition, MPE	HP-UX (LAN Manager X) MPE	Now
	PC management		MPE, HP-UX (not OS/2)	Now
	HP New Wave	MPE, HP-UX, DOS/Windows 3.0	MPE, HP-UX OS/2 Standard Edition	Now SDK In first quarter, 1991
NCR Cooperation (Based upon HP New Wave)	NCR Oesktop Network Print Services Oatabase Access E-mail	OOS	OS/2 SE (MCA) Unix SVR4	March 1991 Mid-1991
AT&T Rhapsody (Based upon HP New Wave)	Star Group LAN Manager PMX Star Mail Unix	Windows 3.0 Unix	Unix System V/386	Late October, 1990 No schedule
Data General CEO Object Office	CEO mail, filing print services, Xodiac transport services	Windows/286 MV Eclipse	MV with AOS/VS	Now
Xerox Globalview	Docu-Team Docu-Pub Document Data Search Retrieval SQL Quick Query	DOS 286/386 (with $3,995 card) Sparc	Sun Sparc	November, 1990

To see how well we crunch numbers, look at our graphics.

Microsoft Excel for Windows.

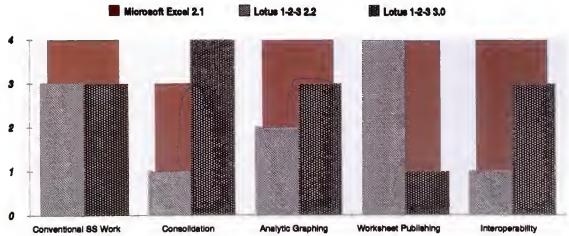
"With solid spreadsheet and charting components and a comprehensive macro language integrated into a powerful graphical environment, Excel is no more 'just a spreadsheet' than a Ferrari or a Porsche is 'just a car.'" **PC Magazine**



Based on the findings of a recent study, switching to graphical applications can yield increased productivity and can result in these dollar savings. ***

Recently, *PC Magazine* placed Microsoft Excel version 2.10 head to head with Lotus 1-2-3 release 2.2 and 3. They measured the essential criteria by which spreadsheets are judged. As you can see from the chart, Microsoft Excel proved to be superior in its balance of capabilities. Further evidence of the advantages of the graphical-based Microsoft Excel over the character-based Lotus 1-2-3 can be seen in a recent study.

Over the years, graphical-based applications result in significant dollar savings since they are faster to learn, faster to use and less frustrating to master.



In this chart,* PC Magazine** *compares the salient spreadsheet criteria of Microsoft Excel and Lotus 1-2-3. As you can see, Microsoft Excel showed its superiority.

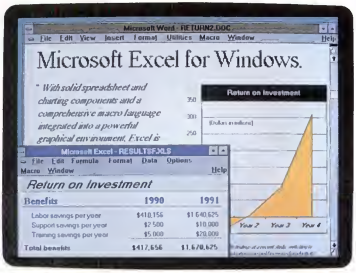
(Incidentally, this report was created using Microsoft Excel linked with Microsoft Word for Windows.)

*For more information, call (800) 541-1261, Dept. M66. Outside the U.S. and Canada, call (206) 882-8661. In Canada, call (416) 673-7638. © 1990 Microsoft Corporation. All rights reserved. Microsoft and the Microsoft logo are registered trademarks and Making it all make sense is a trademark of Microsoft Corporation. Windows is a registered trademark of Microsoft Corporation in the USA and other countries. Prices may vary outside the U.S. and Canada. Microsoft Excel for Windows requires Windows and a minimum of 2MB of memory. Each additional Working Model is $9.95, applicable sales tax not included. Offer good while supplies last and only in the 50 United States. **Reprinted from PC Magazine, April 24, 1990. © 1990 Ziff Communications Company. ***"The Benefits of the Graphical User Interface," Forrester Research, Inc., 1990.*

If you read the report at the left, you can see in just a couple of seconds how well Microsoft® Excel for Windows™ can crunch numbers.

Which is exactly our point.

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Windows can display Microsoft Excel and Word for Windows at the same time so you can see how all elements of your analysis will go together.

And that's not to give up one iota of analytic power.

Fact is, Microsoft Excel gives you more power to make sense of numbers than any other spreadsheet going. Simply because whether you're analyzing or reporting, you get the power of the Microsoft Windows environment every step of the way.

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And consider it done.

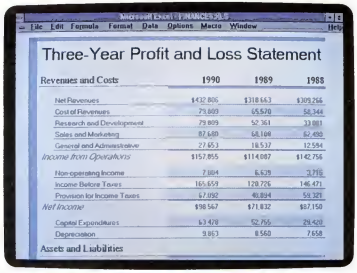
Or if you want to pull data from a variety of databases, you guessed it. Point, click and done.

Then before you wind up, you can do an audit of every formula to give you absolute confidence in your result.

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ing requires tools for connectivity, application development and network management that in some cases simply are not yet on the market.

"You can break up the obstacles to enterprise computing into three areas," said Hal Chapel, president of Vanguard Business Systems, a company that specializes in consulting with major firms on enterprise projects. "You have the disparity of back ends; you have the problem of different front ends linking to the back ends; and you have the standards problems of getting the different network operating environments to talk to each other."

Vendors are going to have to cooperate to make enterprise computing practical.

Unless a company is willing to commit totally to one vendor's multiplatform strategy, as GE Fleet Services has with IBM, vendors are going to have to talk to each other and cooperate with each other to make enterprise computing practical. Fortunately, the signs are strong that the major players are beginning to recognize this. "All now see the bandwagon, and they are beginning to see the only way enterprise computing is going to work, and the only way they can play a successful role in it, is to have cooperation," Chapel said. "In fact, that's almost the new meaning of cooperative processing: to have the vendors cooperating."

THE UNCOOPERATIVE REALITY. Vendor alliances do not always produce the anticipated results. "There's a little confusion in the market right now," said Mike Bailey, systems integrator at Lockheed's missile systems division. "We've decided we're not going to buy anything until next year, and hope the clouds blow away by then." As a facility with some 3,000 Apple Macintoshes and a heavy investment in DEC VAX systems, Bailey was highly interested in the Mac/VAX integration tools that DEC and Apple have been promising over the last several years.

From Bailey's point of view, neither DEC nor Apple have produced the products they promised in a timely fashion, and that has left companies like his in a position of having to shift for themselves. "Two years ago, Apple announced this major focus on networking," Bailey said. "They had great plans, but instead they wound up focusing on multimedia, and left the rest of us hung out to dry."

Bailey has turned instead to third parties for solutions to his DEC/Apple connectivity needs, a process that requires considerably more time just in searching out which products offer what features. "The number of third-party solutions out there [is] growing, but you really have to work hard to identify them and understand them," he said.

Areas in which technology seems to be lagging, according to implementers of enterprise strategies, include network management tools for multiple-protocol LANs and WANs, truly portable application development environments, and the capability to distribute and maintain software across networks. Finding the right tools in such areas can be a problem even when a computer professional has only one type of computing environment to deal with. When a variety of platforms and protocols are involved, the difficulties multiply exponentially.

"Doing things like upgrading software or updating a database is relatively easy on a mainframe, because you just have to make the change in one place and it's there for all users," said Gail Port of Citibank, who has set up the first preliminary client/server application for the bank. "Now we have to find where the program or data is on various servers. It's an infinitely more complex environment in many ways."

ENTERPRISE PIONEERS? In other words, nobody says it's going to be easy. "As usual, the earlier pioneers are coming out of the wagons with a few arrows," Amoco's Chapman said.

Yet virtually every company that has embarked on an enterprise computing strategy feels it is absolutely critical to the entire organization's future. Just getting everyone in the company thinking about systems from a strategic point of view can be its greatest value. "It becomes a communication process for the business itself," GE's Dinwoodie said. "You reacquaint people, or acquaint them for the first time, with the strategy that's driving the business. This isn't really a system project at all — it's a project in how you do your business differently." □



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FROM THE EDITOR

Back in the 1960s and '70s, the concept of computing meant centralized computing: mainframes and minicomputers controlled and used only by professionals.

That changed in the late '70s and early 1980s when personal computers appeared on the scene. PCs typically didn't enter the corporate environment via the MIS department. Instead, individual managers often bought their own machines and brought them into their offices or homes to handle personal information, such as word processing documents or departmental budgets. Thus began the era of personal computing.

It wasn't too long until PCs spread throughout organizations, and companies began to realize just how much information resided in word processors, spreadsheets, and databases on PCs. The need to manage the information, the cost of the machines and applications, and the associated training issues led many companies to come up with standards regarding PC and application purchases.

Over the last few years, a new technology has begun to augment PCs: networking. As most people are divided into small workgroups, they wanted to be able to share information and send electronic mail within the group. As local area networks became more powerful and easier to install and use, these LANs began to proliferate, and we began to hear about workgroup computing issues, with applications such as common schedules and shared, multiuser databases on file servers.

The next step will be to take the information that is now available to individuals and workgroups and spread it throughout the organization. This will allow information to be spread more easily throughout an enterprise; should allow individuals access to more information, and should allow processing power to be much more distributed.

Such enterprise computing relies on several technologies that are beginning to play a larger role in corporate America, including wide area networks (consisting of networks of LANs), internetworking, and client/server databases. Choosing, implementing, and managing these technologies will have a large impact on the way that computers are used throughout business.

Enterprise computing combines some elements of personal computing and some elements of centralized computing. With PCs on individual desktops, users will continue to have a lot of control over their own information, the way they use computers, and the applications they use. But with data being spread throughout an organization, companies will need to pay more attention to issues such as data management and security — the kinds of issues MIS departments have traditionally dealt with on the mainframe and minicomputer level.

But the most important aspect of enterprise computing is not the underlying technology, the management issues, or maintenance. Rather, it is the strategy behind how the information is collected, managed, and used.

Many companies have begun to realize that information can be a strategic asset — used to help them manage their existing businesses, build better relations with their customers, and sometimes define completely new businesses. No one person — or one group of people — can answer all the questions pertaining to companywide strategic computing — top management, MIS, information center personnel, department managers, and even some end-users must be involved in these decisions.

At *InfoWorld*, we believe that over the next few years enterprise computing issues will be central in the management of large and medium-size organizations. This week's Perspectives section (Page 53) gives a broad outline of some of these issues as they affect a variety of companies that want to use information strategically. We've been covering enterprise computing issues in many of our news stories, and this will increase. Starting in January, we will devote a monthly section to an in-depth look at varying aspects of enterprise computing.

Enterprise computing will bring with it a host of new technologies, applications, and issues. *InfoWorld* intends to bring you the information you need to move ahead in this crucial stage in the development of computing.

— Michael J. Miller

TO THE EDITOR

Not a Trivial Amount

In his Tech Talk column (September 24, Page 32), Steve Gibson recommends leaving computers on day and night to minimalize hard disk drive failures.

Gibson goes on to say that he has never bothered to calculate the cost of this advice, because he is so convinced of the advantages.

Allow me to do some calculating for him. If 14 million personal computers were left on 12 hours per night and weekends, then the total nationwide power consumption would equal 464 megawatts per hour, assuming that the average electrical draw per computer was 100 watts per hour. This would exceed the capacity of my local nuclear power plant, which I do not believe anyone would consider to be a trivial amount.

Mickey F. Yurkevicz
Systems Supervisor
Precisionforms Inc.
Jaffrey, NH

Last week, after weighing the arguments on both sides, Steve Gibson wrote that we should leave our computers on all the time to protect their hard disks. In his analysis he never once mentioned the environmental impact of millions of constantly running PCs.

A couple of weeks ago (September 3, Page 56), Jerry Pournelle wrote that we Americans have done about all we can do to conserve energy, reasoning that we should invest heavily in nuclear power rather than learning to save energy.

Are *InfoWorld* columnists paid by utility companies, or did they just sleep through the last 20 Earth Days?

George Beekman
Corvallis, OR

Correction

In the story "Intel Debuts Satisfaxtion Fax/Modem" (September 24, Page 23), an incorrect phone number was reported for inquiries about the board. Buyers should call (800) 538-3373.

Please write to Letters, InfoWorld, 1060 Marsh Road, Menlo Park, CA 94025; MCI Mail: 259-4127; Compuserve: 73267,1537; fax: (415) 328-1049. Include your name, address, and daytime telephone number. Letters will be edited for length and clarity.

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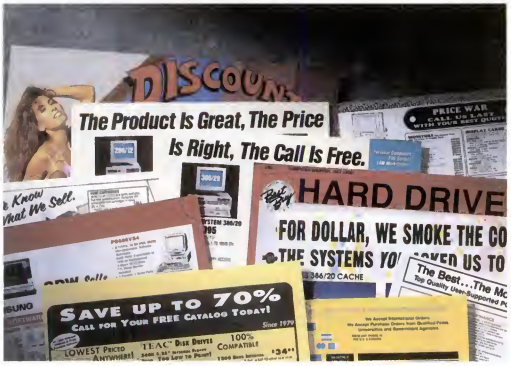
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A USER'S VIEW ■ By Jerry Pournelle

Upgrade to Latest Norton Utilities Awkward, yet Worthwhile

Last time I said, among other things, that while Norton Utilities is a program every PC user needs, if you already have Norton Utilities 4.5 you don't have to rush out and get Version 5.0. From the response I got, you'd have thought I advocated taking drugs or something. I got calls from officials at every level in Symantec, as well as MCI Mail from the program's designer. They all ask how I can say a thing like that. After all, Norton 5.0 is a really big improvement over Version 4.5.

There are great improvements in Disk Doctor (including some bug fixes). There's a new File Fix that repairs mucked up Lotus 1-2-3 and Dbase files. There's even a way to recover from DOS Recover (although anyone who uses the DOS Recover program deserves what's going to happen to him, in the same way that a Russian roulette player deserves his fate). There's all this stuff, and isn't that a big improvement?

Well, yes, I suppose it is.

On the other hand, Symantec sure hasn't made it easy to change from 4.5 to 5.0. While the principal reason you have Norton Utilities is to recover lost files and fix munged disks — and I'll concede that Version 5.0 does that better, and more important for the ordinary user, in a simpler manner than Version 4.5 did — the usual thing you do with Norton Utilities is DS for Directory Sort, LD for List Directories, and FF for File Find. They've done away with Directory Sort and List Directories. They made File Find much more versatile, but also much larger and harder to use if all you want to do is locate one particular file on your disk drive. These are improvements?

Now maybe, just maybe, they didn't do away with DS and LD; but if that's the case, they've done a remarkably good job of hiding what they did with them. There's no reference to them in either the index or the table of contents of the 300-plus-page manual, and while I haven't read every word of that tome, I don't believe they're in there.

So, I'll concede that upgrading to Version 5.0 is worth doing. However, when you do that, you will want to hang onto DS, LD, and FF from your older Norton Utilities. This means protecting them from the stupid 5.0 Install program, which wants to erase them. Moreover, when the Install program offers to rename files for you, make sure it does *not* rename File Find to FF. Leave FF alone. Then, when you've got past the Install monster, go back and rename the new File Find to FFF.EXE, because you will want to be able to run the new file finder easily. The new program will search across more than one disk drive and will also look for a text string, both useful features.

All in all, I'll concede that upgrading to Norton 5.0 is worth doing. But it would have been a lot easier on everyone if they'd done the upgrade right.

NORTON'S IN COMMAND. I like to say I am no fan of DOS shells, but I confess I am addicted to one of them. I consider Norton Commander nearly indispensable. I use it to make new directories and move files around, view files — it's so much easier than the DOS Type command — and to edit ASCII files such as CONFIG.SYS and AUTOEXEC.BAT. The result is that every time we get a new machine around here I install Commander — which means, of course, that it's on all the older machines. For some reason, though, I never noticed that there's a new version, even though I've installed it on several machines that have come in over the past few weeks.

The other day Rob Dickerson of Borland came around to show us some of his company's latest wonders. I was pretty impressed, and when he offered to install test copies of some of Borland's stuff on one of my machines, I jumped at the chance and rolled out the Arche Legacy 386/33, which is just about the fastest machine in the house. It's also one of the machines I recently installed Norton Commander on, and I was startled to see Rob making Commander do things I'd never seen before.

It turns out Commander has been considerably improved. Among other things, you can view files on one-half of the screen as you simply pass the cursor bar over their names on the other half. There's other stuff, including a fairly neat screen saver.

Norton Commander also includes a link program that's supposed to transfer files between two computers, provided that you have "a special cable, available separately." The special cable is actually a null modem cable, meaning that you could use your Laplink cable. However, if you have a Laplink cable you should have Laplink, and that works a lot better than Commander Link anyway. Among other things, Commander Link is a "master-slave" communications program, and that's never as easy to use as the Laplink system in which either machine can control the process.

Another feature of Commander 3.0 is a front-end program for MCI Mail, and it's infuriating me because it won't work with my system. I don't know why. Rob Dickerson says he uses it all the time, and I've since talked to others who use Commander Mail; so I know it *can* work, only it just doesn't for me.

Commander Mail has a setup program that it walks you through. You enter your MCI account name and password, modem initialization string (Commander Link's default string works just fine for getting my U.S. Robotics Courier HST to dial MCI Mail), phone number, and the like; then you tell Commander Mail to do its thing, either through a direct command or through a schedule of times when you want it to call and get your mail.

There are also provisions for creating MCI Mail off-line using a full-screen editor.

All of this is wonderful, and it works for most people; but when I try it, MCI Mail answers, I hear the tones indicating that we're locked in — and Commander just sits there. It never seems to send a carriage return to get MCI Mail to send a prompt. Whatever happens, after about 10 seconds the program disconnects, tries again and, of course, gets the same result. It will apparently continue trying until Doomsday if you let it. If there's any way to fix things here I don't know it. Certainly there's nothing in the manual about this problem.

Anyway, if you're lucky enough to get Commander Mail to work, it's pretty neat. Meanwhile, even without that feature, it's probably worth upgrading to Commander 3.0.

The Norton Utilities 5.0 and The Norton Commander 3.0 are available from Symantec Corp., Peter Norton Computing Product Group, 10201 Torre Ave., Cupertino, CA 95014; (800) 441-7234, (408) 252-3570, (800) 626-8847 in CA.

Jerry Pournelle is a noted science fiction writer and computer columnist. The views expressed are his own.

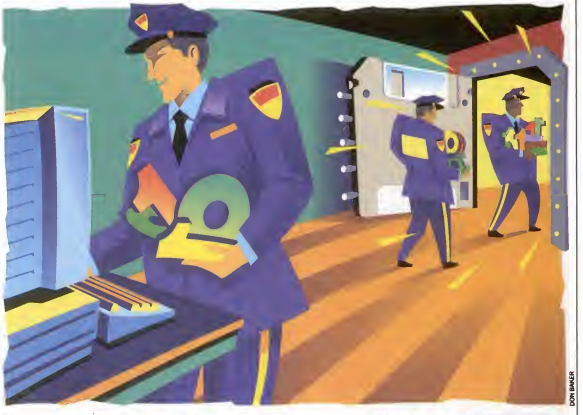


PRODUCT COMPARISON

Backup For Safe Keeping

InfoWorld puts seven backup software utilities to the test.

BY TOM BIGLEY REVIEW BOARD



DON BAKER

In the beginning of backup software, there was DOS Backup and Restore. These operating system utilities, however, proved slow and cumbersome. In the last decade, most users who prefer backing up their data to floppy disks abandoned DOS in favor of a wide assortment of backup software packages that came on the market.

In terms of speed and autonomy, floppy backup can't compete with backup hardware, such as tape drives. (See our comparison of minicartridge systems, July 23, Page 51). But if all you need is a way to regularly back up relatively small amounts of data, nothing can beat the price and simplicity of backup software used with floppies. Unlike hardware, which can cost thousands of dollars and require some technical expertise to set up and get started, software packages usually list for less than $200 and are simple enough to have you making your first backup in minutes.

In this comparison we look at seven products in a stand-alone environment. They include Gazelle Systems' Back-It 4, The Software Toolworks' Backup Pro, Fifth Generation Systems' Fastback Plus, The Finot Group's Keep Track Plus, Symantec Corp.'s Norton Backup, Central Point Software's PC Backup, and United Software Security's Taketwo Manager.

All of the products here may be most commonly used for backing up data to floppies; however, all of them will also work with any DOS device, which is defined as any device that can be configured as a DOS drive letter (such as another hard drive or a Bernoulli Box). In addition, PC Backup is "hard coded" to work with several quarter-inch tape drives. Keep Track Plus was the only product in the comparison to also come in a version for OS/2. In the sidebar on Page 83 we look at a beta version of market newcomer Sytos Plus, Sytron Corp.'s DOS retail version of its OEM backup software. When all of its bells and whistles have been added, Sytos Plus may support the largest number of devices and operating systems of any backup software package.

All of the packages here have at least a few features in common. Without exception, they are fairly simple to learn and use. All are capable of some level of saving preconfigured, customized backup sets for repeated use. All but Fastback Plus and Norton Backup can schedule backups for you, reminding you to back up particular files at specific times. All but Back-It, Keep Track, and Taketwo support a mouse.

Two products, Keep Track and Taketwo, store backup files in a totally DOS-compatible format (the others use proprietary formats). DOS compatibility is a double-edged sword. Because files are stored on backup disks in the same format as they are on your hard disk, you can always retrieve them using the DOS Copy command. You also can work directly from your backed up disks. The drawbacks are that DOS is slow and offers no appreciable error correction. As a result, Taketwo and Keep Track Plus cannot reconstruct damaged data.

All of the products except Taketwo Manager can format disks on the fly, a useful time-saving feature. And all but Keep Track and Taketwo offer at least one level of data compression, which saves disk space.

All of the packages except Keep Track and Taketwo use the dual Direct Memory Access (DMA) operating mode for efficiency. These same packages take advantage of the CPU idle (or "background") time for compressing data.

A few of these packages offer more than a backup utility. Keep Track and Taketwo Manager also include file managers, and PC Backup is one of a host of utilities included in Central Point's PC Tools Deluxe software package. (We look at a beta version of Central Point's brand-new stand-alone version of PC Backup in Impressions on Page 86.)

For this comparison we revamped our scoring criteria for backup software. (See How We Test, this page.) Although speed in backup software is important, reliability — restoring data and, if that's not possible, warning you of damaged files — is paramount. Ease of learning is also important, but we believe ease of use is even more crucial; if a package isn't easy to use, you won't protect your data as often with regular backups. Our report card weightings reflect these considerations.

Norton Backup, which had problems reporting damaged files in our May 7 triple-header review with Fastback Plus and PC Backup (Page 76), now performs well, thanks to a recent update.

Tom Bigley is an experienced microcomputer user who works in a computer support capacity for the city of Olympia, Washington.

Products Reviewed

Back-It 4 Version 1.0 Page 72
Backup Pro Version 1.03..... Page 72
Fastback Plus Version 2.10 Page 72
Keeptrack Plus Version 2.1.... Page 72
Norton Backup Version 1.10.42 Page 73
PC Backup Version 6.0..... Page 73
Taketwo Manager Version 2.10b..... Page 73
Executive Summary Page 68
InfoWorld Report Card..... Page 68

HOW WE TEST

BACKUP SOFTWARE

Our primary test bed was an 8-MHz Intelligent Data Systems PC-286 AT running MS-DOS 3.3 with 2 megabytes of expanded memory, two high-density floppy drives (5¼-inch and 3½-inch) and two Seagate RLL formatted hard drives (a 30-megabyte ST238R formatted as a single partition, and a 60-megabyte ST277R split logically into two 30-megabyte partitions).

We used high-density disks with the 5¼-inch floppy drive for our speed and reliability tests. To double-check our test results we repeated some benchmarks on the 3½-inch drive on the IDS AT and other equipment, including a Data General Walkabout SX laptop and an IBM PS/2 Model 65.

Products and survey weightings were chosen based on a survey of 1,000 *InfoWorld* readers involved in using or buying backup software.

PERFORMANCE:
We tested performance in two areas; reliability and speed.

See How We Test, Page 68

How We Test

Continued From Page 67

Reliability: We graded reliability on the software's capability of recovering data from damaged disks, and the accuracy and completeness with which the program reported damage.

First, we tested each program's basic capability to back up data and restore it intact. We loaded a small test subdirectory with just enough data to ensure that all the backups would fill one disk. We used the maximum error correction available and the lowest common denominator of data verification across the programs. We used the program's Restore function to restore the files to a separate drive and used DOS Comp to compare the restored files to the originals. All of the packages passed with flying colors.

After this, we used an engineer's scale and the tip of a knife blade to scratch the first disk of each backup set. This was intended to simulate real-world damage, such as that from a scratch made by a paper clip. In order to see how well each program could recover different areas of damage, we tested each program with two variations of the scratch. We scratched one disk with a three-eighth-inch scratch perpendicular to the disk tracks, and the other with a quarter-inch scratch tangent to the tracks. We then tried to restore both damaged disks, noting error messages, and finished up with another DOS Comp of recovered files. We ran each test at least twice until results were acceptably consistent.

The results of our reliability tests were varied. Keep Track and Taketwo both produce DOS-compatible backup files. Therefore, they lack an error correction scheme and were unable to repair data damaged by the scratches. However, they still receive a satisfactory grade because they notify you of the damage. Backup Pro gave us an erroneous report, claiming that all files had been successfully recovered from the disks with perpendicular scratches, even though our subsequent DOS Comp check revealed damage to several of the recovered files.

The remaining four programs handled the perpendicular scratch competently, recovering all the damaged data with 100 percent accuracy, although at some cost to speed. None of the programs were able to salvage 100 percent of the data from the tangentially scratched disks. However, PC Backup performed best here and overall, restoring all but one file, and so is scored excellent.

Although several of the programs did impressively well in data recovery and damage reporting, none provided a summary listing of lost or damaged files — we had to write down the names of the files during the restore as the errors were encountered. We also noted that most of the programs do not allow you the option of keeping or deleting corrupted files; depending on the program, it automatically deletes or saves them instead.

Speed: We graded speed of backup in terms of simple overall order of completion, awarding a score of excellent to the fastest product.

Our first test was a full backup of approximately 19 megabytes of data in 739 word processing, graphics, database, and program files located on the ST238R hard drive.

Many of the packages here are capable of near-phenomenal backup speeds (Back-It 4 claims 10 megabytes a minute) using preformatted disks with many features turned off. Although variations between the programs make it difficult to match settings exactly, we used what we believe is a typical setup for a routine full backup: unformatted disks, error correction on, data compression on (or at its lowest level), and data verification at a "write verify" or equivalent level. Keep Track Plus and Taketwo Manager do not offer an error correction scheme, which recovers data from damaged disks, or data compression. Taketwo Manager was the only package here that was incapable of formatting on the fly (it lacks its own formatting utility, so we had to DOS Format the disks in a separate step). All the programs are capable of some means of verifying data during backup and restore operations.

Test results ranged from PC Backup's 24 minutes and 46 seconds to Taketwo's 50 minutes and 10 seconds. Interestingly, the fastest programs used the least amount of space. PC Backup, Norton Backup, and Fastback Plus, all early finishers, used 15 disks each. Back-It 4, the fourth fastest program, used 16 diskettes, and the last three each needed 17.

We backed up a subset of the same data for the second set of speed tests. This consisted of seven subdirectories loaded with approximately 6 megabytes of pro-

See How We Test, Page 73

Executive Summary

With the exception of one product, all the backup programs in this group should be able to handle your backup needs.

If you like intuitive, mouse-driven operations and are willing to pay more for reliability and speed, PC Backup, Norton Backup, or Fastback Plus fill the bill. **PC Backup**, our highest scorer, has the additional benefit of coming bundled with an amazing collection of disk and desktop utilities, while **Norton Backup** can handle your multiple hard drive volumes in a single backup set. At $189, **Fastback Plus** is $40 more than Norton and PC Backup, and is the most expensive program here, though it performs well.

Taketwo Manager will manage your backup schedule and save your files in a fully DOS-compatible format. It comes with a TSR file manager that can recover those files you deleted by mistake and move your files and subdirectories around with ease. It's slow, however, one reason being that it is the only program here that cannot format floppy disks on the fly.

Keep Track Plus is faster, also creates DOS-compatible backup files, and also comes with a file manager, but we encountered some frustrations in error handling and support, which lowered its grade. Neither Taketwo nor Keep Track are capable of correcting errors if your disks happen to get damaged.

If mouse support doesn't matter but you want speed and reliability, take a look at **Back-It 4**. It's on the expensive side ($169), but it has a few extra features, such as backing up over multiple volumes and a scheduler.

If it weren't for its extreme reliability problem of ignoring damaged files, Toolworks' **Backup Pro**, intuitive and by far the least expensive package at $59.95, would be a fine choice as a backup utility. Unfortunately, Backup Pro's neglect to report damage makes it too untrustworthy.

REPORT CARD

INFO WORLD

Backup Software

	(InfoWorld weighting)	(Your weighting)	Back-It 4 Version 1.0	Backup Pro Version 1.03	Fastback Plus Version 2.10	Keep Track Plus Version 2.1	Norton Backup Version 1.10.42	PC Backup Version 6.0	Taketwo Manager Version 2.10b
List price			$169	$59.95	$189	$99	$149	$149	$139
Performance									
Reliability	(150)	()	Very Good	Unacceptable	Very Good	Satisfactory	Very Good	Excellent	Satisfactory
Speed	(100)	()	Good	Satisfactory	Good	Good	Very Good	Very Good	Poor
Documentation	(50)	()	Very Good	Satisfactory	Satisfactory	Satisfactory	Very Good	Very Good	Satisfactory
Ease of learning	(50)	()	Good	Very Good	Very Good	Satisfactory	Very Good	Very Good	Satisfactory
Ease of use	(150)	()	Good	Good	Satisfactory	Satisfactory	Very Good	Very Good	Satisfactory
Error handling	(200)	()	Satisfactory	Poor	Very Good	Poor	Very Good	Good	Satisfactory
Support									
Support policies	(50)	()	Excellent	Good	Good	Good	Good	Good	Excellent
Technical support	(50)	()	Satisfactory	Poor	Good	Poor	Satisfactory	Very Good	Satisfactory
Value	(200)	()	Very Good	Poor	Very Good	Satisfactory	Very Good	Excellent	Satisfactory
Final scores			**6.6**	**3.5**	**6.7**	**4.5**	**7.3**	**8.0**	**5.0**
Use your own weightings to calculate your score									

GUIDE TO REPORT CARD SCORES

InfoWorld reviews only finished, production versions of products, never beta test versions.

Products receive ratings ranging from unacceptable to excellent in various categories. Scores are derived by multiplying the weighting (in parentheses) of each criterion by its rating, where:

Excellent = 1.0 — Outstanding in all areas.
Very Good = 0.75 — Meets all essential criteria and offers significant advantages.
Good = 0.625 — Meets essential criteria and includes some special features.
Satisfactory = 0.5 — Meets essential criteria.
Poor = 0.25 — Fails short in essential areas.
Unacceptable or N/A = 0.0 — Fails to meet minimum standards or lacks this feature.

Scores are summed, divided by 100, and rounded down to one decimal place to yield the final score out of a maximum possible score of 10. Products rated within 0.2 points of one another differ little. Weightings represent average relative importance to *InfoWorld* readers involved in purchasing and using that product category. You can customize the report card to your company's needs by using your own weightings to calculate the final score.

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InfoWorld showed Elegance 486i leading the pack again as a network file server and stand-alone system as well.



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PC Magazine*, September 11, 1990 *PC Magazine*, September 25, 1990
†MacWorld, July 30, 1990 *††Computer Currents*, August, 1990

Back-it 4
Version 1.0

Back-it 4 is Gazelle Systems' newly-released update of their popular backup utility. It features reliable operation and a built-in backup scheduler, and can run backups that span multiple hard drives.

Back-It is the only package in the group that lets you decide whether you want to keep or discard a file that's been damaged.

PERFORMANCE: RELIABILITY

Back-It was one of the most reliable products in the comparison. It handled the perpendicularly scratched disk without problems, popping up an advisory message that identified the track, side, and sector that the program is repairing. The file name pointer at the bottom of the screen identifies the name of the file being worked on.

Back-It was also among the most capable at recovering data from the disk with the scratch running alongside the tracks. It repaired all but three of the files, and gave us the option to keep or discard these. **Score: Very Good.**

PERFORMANCE: SPEED

Although not the fastest of this group, Back-It's speeds are respectable: 31½ minutes for the 19-megabyte full-backup test and a little over 5 minutes using its Super compression setting for the 6-megabyte partial test.

Unformatted disks delay Back-It because the program does a second read of each track it writes to in order to ensure the track is good, according to the vendor. **Score: Good.**

DOCUMENTATION

Back-It's manual is well written and easy to understand. It has an adequate table of contents and is well indexed. The spiral binding lets the manual lie flat. We also like the Backup Checklist and map of program commands.

Most of Back-It's screens display a list of available commands, along with a help box describing the command or function under your cursor. There is on-line help available on most screens at the touch of a key. **Score: Very Good.**

EASE OF LEARNING

Back-It is reasonably easy to learn, although less so than some of the others in the group. The program's mix of function keys and point-and-shoot cursor movements is not intuitive and it will take a while before operation becomes natural. You'll spend a lot of time reading the screen to figure out what to do next.

Back-It, Continued on Page 76

Backup Pro
Version 1.03

Backup Pro is a stand-alone backup utility that features Microsoft Windows-like operation with pull-down menus, point-and-shoot selection, and mouse support. If it bears a striking similarity to earlier versions of PC Tools' PC Backup, there's good reason: The Software Toolworks wrote the original version of the character-based interface for PC Backup.

PERFORMANCE: RELIABILITY

Backup Pro did an acceptable job recovering some of the files damaged by our scratch tests, but it had several potentially disastrous problems. It restored all the files that were damaged by the perpendicular scratch without generating any error messages. The only indication we had of problems with the disk was a drastic slowdown in the track counter. When we compared the recovered files to the originals, we found two of the files damaged.

Backup Pro did report errors when we ran the tangent scratch test, and gave us the option to delete the file or continue trying to recover it. Unfortunately, we found damage in one of the files Backup Pro claimed to have repaired.

Score: Unacceptable.

PERFORMANCE: SPEED

Backup Pro came in close to last in all our speed tests, taking almost 34 minutes to complete the 19-megabyte backup. (Only Taketwo Manager, which uses a DOS-compatible format, was slower.) The vendor attributes part of the slowness to an enhanced proprietary compression algorithm. **Score: Satisfactory.**

DOCUMENTATION

Backup Pro's manual is well written and logically organized. It has a brief but adequate table of contents; however, the index is limited and misnumbers several pages.

The installation and start-up sections should have you up and running quickly. Each significant operation has its own section containing step-by-step instructions and illustrations of the screen displays. **Score: Satisfactory.**

EASE OF LEARNING

Backup Pro's Windows-style display, logical menus, and point-and-shoot operation should have you running backups in short order. However, users without a mouse may take a little longer to learn the key strokes.

Installation is automatic but you'll have to configure the program for your

Back Pro, Continued on Page 76

Fastback Plus
Version 2.10

Fastback Plus was the first backup software product to offer high-speed DMA (direct memory access) and format disks on the fly, according to the vendor. Fastback Plus has a well-established reputation as a fast, consistent, reliable performer. It's unique in the group for its file compatibility with Fastback II, Fifth Generation's Macintosh backup utility.

PERFORMANCE: RELIABILITY

Fastback Plus was consistently among the best at recovering data from damaged disks. It handled the perpendicular scratch with ease, finding 104 errors and correcting them all; a DOS Comp confirmed 100 percent accuracy. Like the others, Fastback had trouble with the tangential scratch. It was able to correct just 14 of the 52 errors it found, and could not repair two of the files.

Fastback Plus does not offer the choice of deleting files it can't repair. Your options are to abort the operation or continue, writing the damaged file to disk.

Unfortunately, when it warns you of a damaged file, Fastback's error message box covers the file name — you have to select to continue, or abort, before you can see the name. **Score: Very Good.**

PERFORMANCE: SPEED

Fastback Plus was a middle-of-the-road performer in the full backup and uncompressed partial speed tests, and one of the fastest programs using compression variations. **Score: Good.**

DOCUMENTATION

Fastback's manual is well written and well illustrated, although a few aspects were inadequately covered, such as mouse support. The table of contents is detailed and complete, and there is a handy menu organization chart that references page numbers. The index is somewhat incomplete.

Start-up instructions in the manual will get you quickly up and running, providing different paths for different user levels. We particularly like the context-sensitive on-line help — it is clear, informative, and tailored to the selected user level. **Score: Satisfactory.**

EASE OF LEARNING

Fastback's installation utility uses the program's macro language to install Fastback onto your hard disk; it then configures the program for your system and runs a quick reliability test.

After installation, Fastback Plus' generally intuitive operation lets you make your first backup quickly. You can start

Fastback Plus, Continued on Page 76

Keeptrack Plus
Version 2.1

Keep Track Plus is The Finot Group's combination backup and file manager utility. It is one of two programs in this group that stores files in a 100-percent DOS-compatible format, letting you retrieve backup copies with DOS commands or even use the files directly from the backup disk. It's also the only program here that comes in an OS/2 version and is compatible with DOS 4.X.

Keep Track features fast data transfer with on-the-fly formatting, a built-in backup scheduler, and a Microsoft Windows-type interface display with pop-up submenus and function-key operation.

PERFORMANCE: RELIABILITY

Keep Track stores data in DOS-compatible format that lacks any special error correction. It displayed DOS-like Retry and Ignore messages whenever it encountered the damage on our test disks. There is no option that allows you to skip to the next file; Retry is unable to move past anything DOS can't recover. We were forced to either escape out of the restore (which took us back to the menu) or select Ignore and let Keep Track write the corrupt data to the hard disk. We had to write down the names of the damaged files as each error occurred.

Score: Satisfactory.

PERFORMANCE: SPEED

Keep Track Plus is fairly fast for a program that does not use DMA data transfer and stores its files in a DOS-compatible format. It completed our 19-megabyte backup in 31½ minutes and was second only to Norton Backup in the uncompressed partial backup.

Keep Track's speeds are doubly impressive in view of the fact that it does not detect disk changes during backups and restores. **Score: Good.**

DOCUMENTATION

Keep Track's manual is well written and logically organized, with a complete table of contents and index. However, it's written for Version 2.0 and has not yet incorporated a 15-page addendum in the back that covers 2.1 features.

Keep Track's screen menus are augmented by adequate on-line help.

Score: Satisfactory.

EASE OF LEARNING

Despite Keep Track's screen menus and on-line help, some of the procedures are confusing. Although you should be able to run basic backups quickly, the finer points of this program will take some work to master.

Keep Track's installation utility copies the program files to the subdirectory of

Keep Track, Continued on Page 76

Norton Backup
Version 1.10.42

After some initial reliability problems (see review, May 7, Page 76), the Peter Norton Group, now a division of Symantec Corp., has gotten it right with the latest version of Norton Backup.

Running from an intuitive windowed screen with point-and-shoot operation, Norton Backup provides a combination of speed, reliability, and easy operation that should void all those excuses you use for not doing your backups.

PC Backup
Version 6.0

The biggest change in PC Backup since we last looked at it is its availability. In addition to still being offered as part of Central Point's PC Tools Deluxe software package, the backup program is scheduled to be released as a less expensive stand-alone product called Central Point Backup by the time this comparison is published. Both offerings of the product will get an updated interface that will more closely resemble Microsoft Windows, according to the vendor. In addition to your disk drives and any DOS device, PC Backup also supports tape drives from several vendors, including IBM and Compaq.

Taketwo Manager
Version 2.10b

Taketwo Manager is United Software Security's combination backup utility and file manager. Like Keep Track, it stores backed-up files in a DOS-compatible format, which allows them to be retrieved using DOS commands, or even used as is from the floppy.

Taketwo works with any DOS-compatible device.

PERFORMANCE: RELIABILITY

We ran into reliability problems with earlier versions of Norton Backup, which had difficulty not only in recovering data but, in certain circumstances, restored corrupt files without reporting their existence. Those problems are gone with this incremental update (1.10.42) and the program is now among the best at reconstructing the data we damaged with our test scratches.

Norton was 100 percent successful recovering all the errors caused by the perpendicular scratch. It corrected 24 out of 48 errors resulting from the more troublesome tangential scratch, and automatically deleted two files as unrecoverable. **Score: Very Good.**

PC Backup was the best at recovering data from our damaged disks. DOS Compare confirmed PC Backup was 100 percent successful in our perpendicular scratch test, in which it reported 99 errors corrected.

Of the data damaged by the second scratch, PC Backup recovered all but one file, which it automatically deleted. It reported 10 errors recovered and 16 unrecovered. **Score: Excellent.**

Like Keep Track, Taketwo stores backup files in a DOS-compatible format without any error correction scheme beyond the one in DOS. As a result, it was unable to repair the damage on our scratched test disks. When it encountered damage, Taketwo popped up a DOS-like error message reporting a bad sector and offered us the standard Abort, Retry, and Ignore options. Selecting Ignore caused Taketwo to write the damaged data to our hard drive. As with Keep Track, Retry is unable to move past anything DOS can't recover. Abort dropped us out of the program and back to the DOS prompt.

You can have Taketwo echo to a printer as each file is restored; however, it does not identify which of the recovered files are corrupt. **Score: Satisfactory.**

PERFORMANCE: SPEED

Norton Backup is a close contender with PC Tools Backup for the overall fastest package. It was also the best at saving disks, although at some cost in speed. When we tested with data compression set to "Save Disks Low," Norton packed our test data into the least amount of disk space but slipped several slots in the speed standings. **Score: Very Good.**

PC Backup consistently outran the rest of the group in every speed test but the uncompressed partial backup, where Norton Backup was a little faster. **Score: Very Good.**

Taketwo was the slowest program here, one reason being that it cannot format disks on the fly. During configuration, you must designate an outside program to use. (We used DOS format).

Even if you use preformatted disks, Taketwo drags because its method of reading the hard disk to mark and catalog the files that match the backup specifications is particularly slow. **Score: Poor.**

DOCUMENTATION

Norton Backup's documentation is consistent with the high quality we've grown accustomed to in other Norton products. The sturdy, softbound manual is well written, logically organized, and easy to understand. Its quick-start section should have you running your first backup within minutes.

Norton's screens lead you through each operation, providing logical selections and information at each step, but context-sensitive help provides more assistance if you need it. Symantec now includes a coupon for a free backup administration guide. **Score: Very Good.**

PC Backup's manual is well written, easy to follow, and liberally sprinkled with helpful illustrations. It has a complete table of contents and index. The manual is sturdy and lies flat.

A PC Setup reference guide will speed you through installation procedures. Although you probably won't need it much, context-sensitive help is available at the touch of a key or the click of a mouse button. **Score: Very Good.**

Taketwo's manual is well organized and has a good table of contents and an adequate index. Some of the sections, including part of the installation procedure, are written for users with at least a basic level of DOS competence.

Taketwo's screens are, for the most part, self-prompting and provide the guidance you need to perform the various functions. However, if you need additional information, on-line help is available at the press of a key. **Score: Satisfactory.**

EASE OF LEARNING

Norton Backup makes learning a breeze with intuitive screens and a point-and-shoot mode of operation supplemented by clear, step-by-step documentation. Each operation has its own detailed chapter.

Installation is automatic to the point of scanning your system to create a **Norton Backup,** **Continued on Page 77**

PC Backup installs automatically when you install the PC Tools package; simple instructions walk you quickly through the configuration process.

PC Backup's logical, intuitive system of pull-down menus and point-and-shoot operation should have you up and running very quickly. If you use a mouse, **PC Backup,** **Continued on Page 77**

Taketwo's basic operation is generally easy to learn, although there are some procedures that novices will need help with — such as installation. Part of the installation process is automatic, handled by Taketwo's install utility, but you'll have to modify your CONFIG.SYS file yourself, as well as configure the program **Taketwo,** **Continued on Page 77**

How We Test

Continued From Page 68

gram graphics and data files. We used preformatted disks this time (assuming that partial backups would frequently be made to older, already formatted backup disks). We tested with compression off and at every level the package offered to show the effect on speed.

Our results in the partial backup testing generally paralleled those of the full backup test. At their fastest settings, PC Backup, Norton Backup, and Fastback Plus all finished in under 5 minutes. At other settings, the finish order changed somewhat — but revealed no real surprises. All the programs needed six disks to store the data in uncompressed form, but were capable (except for Keep Track Plus and Taketwo) of reducing that to four or five disks without much loss of speed.

Many of these packages claim near-phenomenal backup speeds using preformatted disks with many features turned off.

In fact, all the programs except Backup Pro were faster with some data compression than without.

We ran informal tests on (but did not grade) the packages using several other setting configurations to see how they would affect speed. When we disabled error correction and data verification features, we saw only minor gains in speed — in our opinion not enough to warrant abandoning these safeguards.

We also tried various data verification settings beyond "standard." All the programs that offer this option use some type of routine to compare the backed-up data on the disks to the original data on the hard drive. Norton Backup and Keep Track Plus are capable of verifying on the fly; all others compare routines run as separate operations. Either method slows speed considerably and probably will be reserved for especially important backups in which time is not a factor.

DOCUMENTATION:
Documentation scores reflect the quantity and quality of both written and on-line information. At a minimum, documentation should describe the product and how to use it. We award bonus points for a quick-start guide, on-line tutorial and help programs, a quick-reference card, and a written tutorial. Poor organization, missing information, or an incomplete index lower the score.

EASE OF LEARNING:
Ease-of-learning scores depend on the user interface and the intuitive design of the products. Other factors that influence this score include the complexity of the program and the quality of documentation and tutorials. To earn e satisfactory **See How We Test, Page 77**

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Back-It 4 (Continued)

The installation program gives you a choice of where you want to put the program and whether you want your AUTOEXEC.BAT and CONFIG.SYS files updated. It automatically tests your hardware to ensure that the program can run at maximum speed. **Score: Good.**

Backup Pro (Continued)

hardware; the manual does a good job of explaining that process.
Score: Very Good.

Fastback Plus (Continued)

to work at once by using the default settings for a complete backup. Even if you want to customize or automate your backups, you may not need the manual — the logical menu system and on-line help alone should see you through.
Score: Very Good.

Keeptrack Plus (Continued)

your choice, but you'll have to modify the AUTOEXEC.BAT file yourself if you want to include the program in your path.
Score: Satisfactory.

EASE OF USE

Though a little difficult to remember at first, Back-It's combination function key/cursor pointing is easy to use. Selecting individual files is awkward, however. We had to constantly relearn the program by reading screen instructions.

Back-It is one of only two programs in the group capable of spanning multiple volumes, on the same or different hard disk drives. Back-It also was the only program that let us make the decision as to whether to keep or delete the damaged files it found, a useful option if you want to try to reconstruct a data file.

Back-It includes an automatic backup scheduler. In addition to its own internal formatting utility, Back-It offers a memory-resident disk formatter you can use with other software. Back-It will compress your data. It does not support a mouse. **Score: Good.**

The features that make Backup Pro easy to learn also make it easy to use. We found it very easy to come back to after working with other programs in this group, although we usually had to use the on-line help to explain the file selection options — Backup Pro uses a somewhat confusing combination of highlighting and tagging.

Backup Pro has a timer function that makes it easy to schedule up to eight unattended backups. **Score: Good.**

Fastback's menus make learning easy but are a little awkward to use, compared to the other programs here. File selection, for example, requires that you use a nonintuitive combination of keys to navigate around the screen. Fastback's recent addition of mouse support should have made this easier, but the mouse merely duplicates the cursor keys.

Fastback Plus is incapable of easily — or accurately — restoring files to a different subdirectory on the same disk. (You might use this procedure to transfer files to the same logical drive on another computer or compare a collection of archived files.) The program will lose the original directory structure and dump all the files into a single new subdirectory (which you have to manually create for it), so all but the last same-name files will be lost if you don't take precautions.
Score: Satisfactory.

Some of Keep Track's procedures are unintuitive and a little confusing, particularly file selection. If you use Keep Track regularly to manage your hard disk, backup procedures should become second nature, since they're incorporated into the file manager. However, if you use Keep Track only for occasional backups and restores, plan on spending some time relearning procedures.

Keep Track's backup and restore screens replace the track counter with an advance warning tone that sounds shortly before the disk is full. This feature freed us from having to watch the screen to know when to prepare to replace a disk.

Keep Track allows you to use an exception file to specify custom backups, but you must create the file with your word processor or text editor. There is no file compression or mouse support.
Score: Satisfactory.

ERROR HANDLING

Back-It handled all of our error tests well, except for accepting a faulty 1-megabyte disk. We prefer that faulty diskettes be excluded completely from the backup set.

Back-It allows you to turn off or select various levels of overwrite warning for files and disks. **Score: Satisfactory**

Backup Pro performed acceptably in our standard error tests. It has a file overwrite warning option that you can use during restores and backups. It refused to use an earlier disk from the same run, but willingly accepted our faulty and wrong-density disks and stored (and verified) what it could on them.

Unfortunately, the reliability problems we found are error-handling issues as well, and Backup Pro cannot be depended upon to warn you of damaged files. **Score: Poor.**

Fastback Plus handled our test errors in a smooth, capable manner that reflects the program's maturity. It lets you select the level of overwrite protection you prefer, both for disks during backups and for existing files during restores.
Score: Very Good.

Keep Track handled some of our test errors fine but had trouble with others. It correctly refused an earlier disk from the same backup set, but it backed up to our faulty 1.2-megabyte disk, using what space it could.

Keep Track automatically recognizes incorrect density disks and adjusts if the disk is first of the set. However, when we inserted a 360K disk in the middle of our backup to 1.2-megabyte floppies, the program blew up, forcing us to reboot.
Score: Poor.

SUPPORT POLICIES

The vendor offers unlimited toll-free telephone support; support over fax, MCI Mail, and Compuserve; a 30-day money-back guarantee; and corporate extended support plans. **Score: Excellent.**

The vendor offers unlimited support on a non-toll-free number, fax, and an electronic bulletin board. **Score: Good.**

The vendor provides unlimited (non-toll-free) support over phone, electronic bulletin boards, and fax. It also offers extended support hours of 7 a.m. to 7 p.m. Central time. **Score: Good.**

The vendor offers unlimited support on a non-toll-free line and a 30-day money-back guarantee. **Score: Good.**

TECHNICAL SUPPORT

We got through to technical support immediately both times we called. The technician was friendly and answered our questions quickly and correctly.
Score: Satisfactory.

We got through immediately on our first call to a technician who was cooperative but needed more detailed information before he could make any suggestions regarding our problem with inaccurate file recovery from a damaged disk. We were never able to get through again. We waited on hold once for 14 minutes before giving up. We encountered numerous busy signals all the other times we tried to call (over a two-week period).
Score: Poor.

We called technical support twice, waiting on hold for three minutes the first time, and leaving a message and receiving a call back within two hours on our second try. Both times the technician we spoke with was knowledgeable and helpful, and was the only support person who suggested using the DOS Join command to help us achieve backups across multiple volumes. **Score: Good.**

The Finot Group never returned our first call after we left a message on an answering machine. Eight days later we got through immediately and received competent help. We received adequate help on a third try as well. **Score: Poor.**

VALUE

If you are willing to trade a little speed and ease-of-use for high reliability, Back-It 4, listing for $169, is a top contender.
Score: Very Good.

Backup Pro is the least expensive program here (almost half the price of the next most costly). Despite this and its fast, easy-to-use operation, its failure to reliably report the recovery of corrupt data makes it difficult for us to recommend it.
Score: Poor.

At $189, Fastback Plus is the most expensive program in this comparison. However, this is a reasonable price for the fast, reliable insurance Fastback provides.
Score: Very Good.

At $99, Keep Track is a reasonably priced utility that can handle your backups as well as manage your hard disk. Other programs offer more, such as error correction, but you'll pay more.
Score: Satisfactory.

Norton Backup (Continued)

default setup for your hardware configuration and file setup, but it still allows you to set various options to match your preferences. **Score: Very Good.**

PC Backup (Continued)

you should be able to perform your first backup in well under an hour. Navigating the keystrokes won't take much longer. **Score: Very Good.**

Taketwo Manager (Continued)

for your hardware. If you have more than one hard drive, you must run an initialization routine for each one except the one on which Taketwo is installed. Instructions for this step are buried in a rather long README file. **Score: Satisfactory.**

EASE OF USE

Norton Backup is intuitive and easy to use, even if you don't use it regularly. The program supports a mouse, but a system of hotkeys and cursor keys makes Norton easily navigable via keystrokes.

Along with Back-It, Norton Backup can back up files from multiple hard drive volumes in a single operation.

Our complaints are few; for instance, Norton will not use 360K floppies in a 1.22-megabyte drive, and it can't remember selections you've made if you pop out of file selection mode to do something else (you'll have to reselect before continuing). This feature will be added in future releases, according to the vendor.

Norton lacks a backup scheduler, but this could be a problem only if you are using it on a network or with a tape drive. **Score: Very Good.**

The Windows-like interface, with its logically organized pull-down menus and point-and-shoot operation, makes PC Backup as easy to use as it is to learn. Although it runs nearly as easily without one, PC Backup is a good excuse to buy a mouse.

PC Backup lacks much in the way of extra features such as timers and macros, relying on the rest of the PC Tools to provide them. We were able to set up a scheduled, unattended backup with minimal effort using PC Tools' Scheduler and Macro Editor. (The stand-alone version will include a scheduler but won't have macro capability, according to the vendor.) **Score: Very Good.**

Taketwo is easy to use for basic backups and restores. However, if you need a one-time backup of specific files, or want to restore files to another path, plan on a little effort. Taketwo's screens and on-line help may be enough to lead you through the process, but you'll probably need the Applications Examples section in the manual. Taketwo does not detect when you insert a new disk during backups or restores. It also does not offer compression or mouse support.

Taketwo's strong suit is backup management. It can automatically select the type of backup due to be run and the files that need to be backed up. It appends partial backups to the end of the last full backup set. It also keeps track of what files are on each disk in the backup set, and releases a disk for re-use once later copies of all its files exist on the set. **Score: Satisfactory.**

ERROR HANDLING

Norton Backup handled all our test errors without a problem. Many of its error protection schemes, including file and disk overwrite warnings, can be configured or disabled to boost convenience or speed at the cost of risk to your files. **Score: Very Good.**

PC Backup handled all our errors with hardly a pause. You can disable both its file and disk overwrite warnings for improved speed or for overwriting an old backup set, but we recommend that you do it with caution.

Our only complaint is that PC Backup will use faulty disks and disks of the wrong density in its backup set. It writes (and verifies) what it can on the faulty disk and then skips unusable areas until it finds another reliable spot. **Score: Good.**

Taketwo relies on DOS (or whatever format utility you've selected) to identify faulty disks during backup. Once disks have been formatted, Taketwo copies files much like DOS (files can be split across disks, but cannot be retrieved using DOS if they are). Like DOS, you can turn on a verify option to check the file transfer.

Taketwo sailed through all our tests. Our only complaint was that when the program encounters damage on a restore, selecting Abort will drop you completely out of the program and back to the DOS prompt. **Score: Satisfactory.**

SUPPORT POLICIES

Symantec offers unlimited (non-toll-free) support by fax or pbone, and a 30-day money-back guarantee on Norton Backup. **Score: Good.**

Central Point Software provides unlimited support of PC Backup by (non-toll-free) pbone, fax, and electronic bulletin board, and a 60-day money-back guarantee. **Score: Good.**

Tbe vendor offers unlimited support on a toll-free number, support by fax, a 30-day money-back guarantee, and extended corporate support plans for Taketwo. **Score: Excellent.**

TECHNICAL SUPPORT

We got through to technical support with a minimum of effort and time on hold. The technicians showed a solid understanding of the program, though one was unaware of the most recent fix update (from 1.10 to 1.10.42) that corrects Norton Backup's problem with reporting errors. **Score: Satisfactory.**

We had to hold only a couple of minutes each time we called technical support, and received very helpful assistance. One of the technicians supplied a DOS trick and outlined a batch file we could use to help solve our problem. **Score: Very Good.**

We had to leave messages twice with Taketwo's technical support, but we received calls back within half an hour. On our third try we got through immediately. We received quick and correct answers each time. **Score: Satisfactory.**

VALUE

Norton Backup provides a level of speed and reliability well worth its $149 price tag. You can get the package for free if you send in by October 31 a coupon that comes with Norton Utilities 5.0. **Score: Very Good.**

At $149, PC Backup would be a good value even if it were the only program in the box. Bundled with the rest of PC Tools' amazing collection of disk, file, and desktop utilities, it's one of the best deals in the industry. **Score: Excellent.**

Like Keep Track, Taketwo Manager manages your backups and stores your data in a DOS-readable format. At $139, it's a bit more expensive than Keep Track, and it's slower. But if speed or error correction aren't especially important to you, Taketwo may handle your needs very nicely. **Score: Satisfactory.**

How We Test

Continued From Page 73

score, a backup program must be capable of being easily installed and used to perform basic backups by an average PC user.

EASE OF USE:

Like ease of learning, ease of use is in large part a function of the program's design; we evaluate how easy the average user would find the program to use once having mastered the basics. A menu system that is easy to follow and command shortcuts are two features that can simplify using a program.

Ease of use is especially important in backup software because it may influence how regularly you back up your data. Infrequently used software that is not intuitive or does not include sufficient on-screen guidelines will have to be relearned each time it is used.

Our scores were influenced by how easily we picked up the program again after periods of disuse. We boosted scores for logical program flow, clearly prompted screens, and good, contextual on-line help.

Programs that were awkward, confusing, or caused us to refer back to the manual for routine functions received lower ratings.

ERROR HANDLING:

Backup programs exist to safeguard data, so error handling must be flawless. Any type of data loss, even as a result of user error, means that the program has failed to perform its primary function.

We score error handling on how well the programs handle problems such as faulty (bad tracks) and wrong-density disks, disks from the same backup set that have already been filled, overwriting existing files, and out-of-sequence disks during a restore.

We award bonuses to programs whose error messages clearly explain the problem or, ideally, that offer suggestions on how to resolve the problem.

Error handling is also the category where we score the packages' accuracy in reporting data recovered — or not recovered — from damaged disks.

SUPPORT:

Support is divided into two areas: *support policies* and *technical support*.

In scoring *support policies*, we award a satisfactory score for unlimited free support; we add bonuses for support over fax and electronic bulletin board, money-back guarantees, extended hours, a toll-free line, and corporate extended support plans. We subtract points when vendors provide limited or no support.

Technical support scores are based on the quality of service we actually receive in the course of multiple anonymous calls to the vendor and the availability of knowledgeable technicians. We award bonuses for extra helpfulness and subtract points for unreturned calls and long waits on hold.

VALUE:

Value scores reflect the price vs. the performance and features of each package tested, taking into account the competition and the intended market.

This product comparison was developed by Tom Bigley, Review Board, and Carla Mathews, Associate Reviews Editor.

Leapfrog an er

$9,999*
Compaq
DeskPro 386/33L



At $9,999* the Compaq DeskPro 386/33L is yesterday's news.

Tandon 486/25 Desktop	Compaq Deskpro 386/33L
Intel® 80486™	Intel® 80386™
32-bit EISA 486	32-bit EISA 386
4MB RAM expandable to 64MB	4MB RAM expandable to 16MB
200 MB IDE Hard Drive	120 MB Hard Drive
1.2 or 1.44 MB Diskette Drive	1.44 MB Diskette Drive (1.2 Optional)
VGA Monochrome Monitor	Optional Monitor
16-bit Super VGA Video Card	Standard VGA Video Card
Microsoft Windows 3.0	Not available
Microsoft Serial Mouse	Not available
Tandon MS-DOS Software	Optional

Tandon has come out with a 486 that doesn't play around. The Tandon 486/25. The corporate playground will never be the same.

Jump ahead with the computer that *PC Computing* calls "slick, amazingly fast, innovative and reasonably priced by 486 standards…a hot ticket for performance junkies" for only $6,999. That's $3,000 less than a last-generation Compaq® DeskPro 386/33L.

Unlike more expensive computers, with the Tandon 486/25, you actually get what you pay for. For starters, we begin with everything that makes 486 computers so fast, including a 32-bit EISA bus. So now you can move information using the new high-performance peripherals designed especially for 486 computers.

Then we add proprietary Tandon features to make it even faster. Like our exclusive Memory Mapper, which shadows ROM instructions into faster RAM. The Tandon PowerPoster,™ which intelligently bursts write operations onto RAM so you

*List price for the Compaq DeskPro 386/33L, published by HardFacts™ Beverly, MA, October, 1990.

Tandon 486/25 · Price includes: System unit, 4MB RAM; 200MB IDE hard drive; 1.2MB or 1.44MB diskette drive; VGA monochrome monitor; 16-bit video card; keyboard; power cord; Microsoft® Windows™ 3.0, and serial mouse; operation and installation manual; Tandon MS-DOS software and manual. · Upgrade options: 2MB and 8MB memory upgrade kits (to 64MB); 330MB, 600MB, and 1GB SCSI hard disk drives; 650MB ISO-approved optical drive and cartridge; VGA and Super VGA color monitors; graphics accelerator card; 2400 baud modems; network cards; laser printers. **Tandon 386/33 and Tandon 386/25 · Price includes: System unit; 4MB RAM (Tandon 386/33); 2MB RAM (Tandon 386/25); 110MB IDE hard drive; 1.2MB or 1.44MB diskette drive; VGA monochrome monitor; 16-bit video card; keyboard; power cord; Microsoft ® Windows™ 3.0 and serial mouse;**

tire generation.

- 30-Day No Questions Asked Moneyback Guarantee
- Toll-Free Technical Support
- On-Site Service
- One Year Limited Warranty
- Leasing Program Available



$6,999
The Tandon 486/25

At $6,999 the Tandon 486/25 EISA leaps a generation past the Compaq.

can access information more quickly. And Tandon's advanced memory management architecture, which doubles data transfer speed by sending it over a 64-bit data path.

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To order direct, call now:
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FAX: 805-529-8408

Tandon
Where it pays to be direct

operation and installation manual; Tandon MS-DOS software and manual. • Upgrade options: 1MB and 4MB memory upgrade kits (to 16MB); 80387 math coprocessor; additional 1.2MB and 1.44MB diskette drives; 200MB IDE, 330MB ESDI hard drives; VGA and Super VGA color monitors; graphics accelerator card; 2400 baud modems; network cards; laser printers. Tower models available. Please call for information. Tandon reserves the right to amend specifications without notice. Tandon 486/25, Tandon 386/33, Tandon 386/25, and PowerPoster are trademarks of Tandon Corporation. All other products or services are identified by the trademarks or service marks of their respective companies.
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PRODUCT SUMMARY

Back-It 4

VERSION 1.0

Company: Gazelle Systems, 42 N. University Ave., Suite 10, Provo, UT 84601; (800) 233-0383.
List Price: $169.
Requires: IBM PC, PS/2 or compatible; 384K of RAM; DOS 2.0 or later; hard disk.
Pros: Strong reliability; includes TSR scheduler and formatter; capable of multivolume backups.
Cons: Expensive; no file directory screen; untintuitive.
Summary: Back-It is a reliable, moderately speedy backup program featuring a TSR backup scheduler and a disk formatter that can be used with other programs.

PRODUCT SUMMARY

Backup Pro

VERSION 1.03

Company: The Software Toolworks, 60 Leveroni Court, Novato, CA 94949; (415) 883-3000.
List Price: $59.95.
Requires: IBM PC, PS/2, or compatible; 512K of RAM; DOS 2.1 or later; hard disk.
Pros: Intuitive; has timer utility for unattended backups.
Cons: Fails to reliably report corrupt data during restores; technical support difficult to reach.
Summary: Backup Pro is an inexpensive backup program that looks and runs like early versions of PC Tools Backup; however, it's a little slow and unreliable, which makes it difficult to recommend.

PRODUCT SUMMARY

Fastback Plus

VERSION 2.10

Company: Fifth Generation Systems inc., 10049 N. Reiger Road, Baton Rouge, LA 70809; (800) 873-4384.
List Price: $189.
Reqeires: IBM PC, PS/2, or compatible; 330K of RAM; DOS 2.1 or later; hard disk.
Pros: Fast; reliabie.
Cons: Expensive; some awkward procedures; lacks backup scheduler.
Summary: Fastback Plus is a high-priced but fast, reliable backup software product that offers the handy extra of file compatibility with Fastback II for the MacIntosh.

PRODUCT SUMMARY

Keep Track Plus

VERSION 2.1

Company: The Finot Group, 2680 Bayshore Parkway, Suite 101, Mountain View, CA 94043; (800) 748-5480.
List Price: $99 (OS/2 version, $129).
Requires: IBM PC, PS/2, or compatibie; 384K of RAM; DOS 2.0 or later; hard disk.
Pros: Stores files in DOS-compatible format; supports expanded memory.
Cons: Lacks error correction, file compression, and reporting capabilities.
Summary: Keep Track Plus is an inexpensive backup and file management utility that stores files in a DOS-readable format.

BENCHMARKS

INFO WORLD

Backup Software

(Numbers in parentheses indicate number of disks required)

	Back-It 4 Version 1.0	Backup Pro Version 1.03	Fastback Plus Version 2.10	Keep Track Plus Version 2.1	Norton Backup Version 1.10.42	PC Backup Version 6.0	Taketwo Manager Version 2.10b
Full backup[1]	31:31 (16)	33:44 (17)	29:57 (15)	31:32 (17)	27:24 (15)	24:46 (15)	50:10 (17)
Partial backup[2] (uncompressed)	6:46 (6)	7:22 (6)	6:40 (6)	5:55 (6)	5:34 (6)	6:17 (6)	14:11 (6)
Partial backup[2] (with compression variables)							
Save Time	6:34[3] (6)	N/A[4] (4)	4:46 (5)	N/A[5]	4:36 (5)	4:22 (5)	N/A[5]
Save Disks	5:09[3] (5)	8:33	4:53 (5)	N/A[5]	6:03 (4) Low 11:16 (4) High	5:05 (4)	N/A[5]

Times shown in minutes:seconds.
Compression setting of "Save time" indicates software is using CPU idle time to compress data, resulting in compression at no cost to speed. The setting of "Save disks" indicates that some CPU time as well as idle time is being used for compression, resulting in greater compression at some speed cost.
[1]Approximately 19 megabytes, 739 files. Write verify and error correction on, compression on or "low." Media: Unformatted 1.2-megabyte disks.
[2]Approximately 6 megabytes, 232 files. Write verify on, error correction on. Media: Preformatted 1.2-megabyte disks.
[3]Back-It 4 compression settings of "normal" and "super" correspond to save time and save disks settings, respectively.
[4]Backup Pro does not use only the CPU's idle time for compression.
[5]Keep Track Plus and Taketwo Manager do not offer compression.

FEATURES

INFO WORLD

Backup Software

■ Feature
□ No Feature

	Back-It 4 Version 1.0	Backup Pro Version 1.03	Fastback Plus Version 2.10	Keep Track Plus Version 2.1	Norton Backup Version 1.10.42	PC Backup Version 6.0	Taketwo Manager Version 2.10b
Error correction	■	■	■	□[1]	■	■	□[1]
File compression	■	■	■	□	■	■	□
Format on the fly	■	■	■	■	■	■	□
DOS-compatible files	□	□	□	■	□	□	■
OS/2 version	□	□	□	■	□	□	□
EMS support	□	□	□	■	■	□	□
Backup scheduler	■	■	□	■	□	■	■
Back up to network drive	■	■	■	■	■	■	■
Multivolume backups	■	□	□	□	■	□	□
Command-line operation	■	■	■	■	■	■	■
Mouse support	□	■	■	□	■	■	□
Reports	■	■	■	□	■	■	■
Keystroke macros	□	□	■	□	■	■[2]	□
Preset backup configurations	■	■	■	■	■	■	■

[1]DOS error correction only.
[2]Through PC Tools DeluxE macro utility.

PRODUCT SUMMARY

Norton Backup

VERSION 1.10.42

Company: Peter Norton Product Group, Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014; (408) 253-9600.
List Price: $149.
Requires: IBM PC, PS/2, or compatible; 512K of RAM; DOS 3.1 or later; hard disk.
Pros: Fast; reliable; supports expanded memory and multivolume backups.
Cons: Lacks backup scheduler.
Summary: Norton Backup is one of the fastest, most reliable, and well-rounded utilities here, at a reasonable price.

PRODUCT SUMMARY

PC Tools Deluxe/ PC Backup

VERSION 6.0

Company: Central Point Software inc., 15220 N.W. Greenbrier Parkway, Beaverton, OR 97006; (503) 690-8090.
List Price: $149.
Requires: IBM PC, PS/2, or compatible; 512K of RAM; DOS 3.0 or later; hard disk.
Pros: Fast; reliable; easy to use; inexpensive for range of utilities included.
Cons: None significant.
Summary: A top performer soon to be available as a stand-alone product, PC Backup is a steal even as a part of the more expensive PC Tools Deluxe package.

PRODUCT SUMMARY

Taketwo Manager

VERSION 2.10b

Company: United Software Security inc., 8133 Leesburg Pike, Suite 380, Vienna, VA 22182; (800) 892-0007.
List Price: $139.
Requires: IBM PC, PS/2, or compatible; 512K of RAM; DOS 2.1 or later; hard disk.
Pros: Stores files in DOS-compatible format; manages routine backups.
Cons: Slow; must format disks as separate operation; lacks error correction and data compression capabilities.
Summary: Taketwo Manager is a moderately priced combination file manager and backup utility that may be suitable if you don't mind going without file reconstruction capabilities.

Backup: What a Difference an Interface Makes

The chore of backing up hard disk drive data is already such an imposition on time and patience for most users that backup software can't be too easy to use.

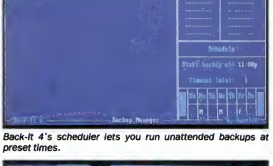
An important factor in ease of use, of course, is the interface. The more clear and logical the interface makes file selection and other operations look, the more quickly you'll pick up a package and keep coming back to it to make regular backups.

Differences in basic ease of learning are miniscule in the packages compared here; however, each package offers a slightly different look (except in the case of Backup Pro and PC Backup — see below) that affects how easy it is to back up your hard disk.

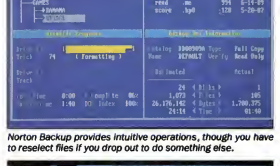
Our vote for best interface goes to PC Backup for its highly intuitive point-and-shoot screen layout, with Norton Backup not far behind for the same reasons.



Keep Track Plus uses a warning tone shortly before a disk is full so you can prepare to insert a new disk.



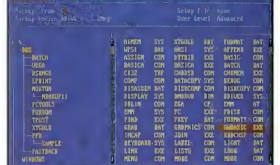
Back-It 4's scheduler lets you run unattended backups at preset times.



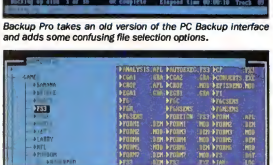
Norton Backup provides intuitive operations, though you have to reselect files if you drop out to do something else.



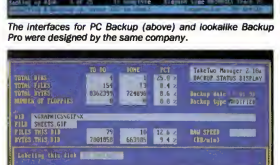
Backup Pro takes an old version of the PC Backup interface and adds some confusing file selection options.



The interfaces for PC Backup (above) and lookalike Backup Pro were designed by the same company.



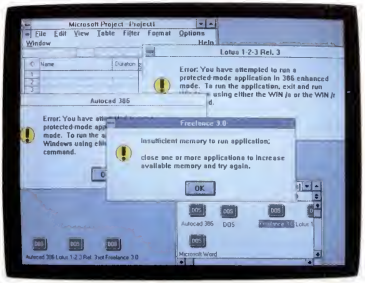
Uninituitive key combinations make file selection in Fastback Plus a little more difficult than it has to be.



Basic backups using Taketwo are simple enough to perform without consulting the manual.

Is Windows 3.0 the end of DESQview™?

Not if you're still using DOS programs.



Windows 3.0. The multitasking, windowing environment.



DESQview 386 2.3. The multitasking, windowing environment.

Are you still using MS-DOS programs on your PC?

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The new DESQview 2.3 and DESQview 386 2.3 let you use your favorite DOS and DOS-extended programs in windows side-by-side on 80286, 80386 and i486 PCs. As you can see above, you can even run Windows programs within DESQview 386. So the next time you get error messages like the ones at the left in Windows, remember how the same set of programs look running in DESQview.

Whatever standard you use—DOS, extended DOS or Windows—DESQview is still the best way to get the most out of the hardware and software you own today.

DESQview. The obvious choice.

Quarterdeck

Quarterdeck Office Systems, 150 Pico Boulevard, Santa Monica, CA 90405 (213) 392-9851 Fax: (213) 399-3802

This comparison was made using a system like the one you might run: Both shots show an ALR FlexCache 33/386 running DOS 3.3 with VGA display adaptor, Novell NetWare v3.01 Rev. A, with IPX/SPX v3.01 Rev A, Microsoft Mouse 7.00, and Microsoft SMARTDrive v3.03 disk cache. Buffers were set to 20. For the Windows screen, we ran Microsoft Windows 3 HIMEM.SYS and EMM386.SYS. For the DESQview screen, we ran QEMM 386 v5.1.

Trademarks: Microsoft, Windows, MS-DOS, 80386, i486, ALR, FlexCache, Novell, NetWare. ©1990 Quarterdeck Office Systems

Sytos Plus Aims To Be the Best Backup Program for Any Platform

For the most part, all the programs in this comparison are disk oriented, relying on your PC's floppy drives as their primary backup storage devices (although all can also be used with any DOS device). All but Keep Track Plus run under DOS only.

Sytos Plus approaches backup from the other direction. Scheduled to be shipping by the time you read this (we looked at a beta version), Sytos Plus is based on Sytron Corp.'s well-known OEM backup software for various mass storage devices. A host of companies, such as IBM and Compaq, bundle their tape backup hardware with Sytron backup software.

As Sytron's first stand-alone retail version of its backup software, Sytos Plus adds floppy drive support as a brand-new feature. An update scheduled before the end of the year will enable it to be used with any DOS device, like most of its competitors. With these last pieces of support popped into place, Sytos Plus designers intend Sytos Plus to be the only backup software you'll use in your office, regardless of your mix of PC hardware and operating systems.

Sytos Plus' Move function is unique, automatically removing files from the source once they've been safely backed up.

Sytos Plus will come in versions for DOS and OS/2 Presentation Manager, and will support most popular LANs. It will use installable software drivers from such companies as Adaptec, Western Digital, NCR, Olivetti, and Distributed Processing Technology to support a long, varied list of storage devices, including built-in floppy drives and various kinds of tape drives. Support for optical disc drives is in the works, according to the vendor.

Using drivers to support various equipment and operating systems enables Sytos Plus to keep a consistent interface, no matter what your configuration. A user seated at a DOS PC backing up to floppy disks sees the same screens and uses the same kinds of commands as he would if he were backing up to a multigigabyte tape drive on an 80486 running OS/2. Finally, Sytos' universal file format will let you move data between operating systems, according to the vendor.

Sytos Plus' screen display is the now familiar, Microsoft Windows-like collection of pull-down menus and pop-up message windows. These intuitive menus and selection screens, along with point-and-shoot operation, mouse support, and context-sensitive, on-line help should lead you through most procedures with little effort. Once you've got the basics mastered, you can automate the whole operation with a scheduler.

Sytos Plus still has a few rough edges. We found some functions frustratingly slow, leaving us staring at a frozen screen while the program worked away on our hard disk, reading files or preparing for a new function. It also lacks a quick return to the main menu — we frequently had to step our way back through multiple menu and screen sequences, one layer at a time, to get back to the main menu. The program doesn't recognize when disks have been changed during backups and restores — you have to press a key.

Sytos Plus provides the same sort of error correction, file compression, and overwrite protection we found in most of the other products in this group. It's also one of the few that support backups and restores across multiple volumes. One of its unique features is a Move function, which automatically removes files from the source once they've been safely backed up.

You can do better than Sytos Plus in both speed and price if you never expect to need a backup software package capable of being used with a wide variety of devices. But if you have more than one operating system on your office PCs or a mixed collection of storage devices, Sytos Plus will be a program to check out.

Sytos Plus, DOS Version 1.20.14c, sells for $225. The OS/2 version is $295. For more information contact Sytron Corp., 117 Flanders Road, Westboro, MA 01581; (508) 898-0100.

— Tom Bigley

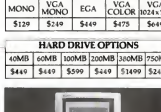
386-25 $1499
- 80386 25Mhz cpu on AMI motherboard with setup and diagnostics built-in BIOS
- 64K static cache memory
- 4MB memory expandable to 8MB on board
- 80387 or Weitek 3167 co-processor support
- 1.2MB or 1.44MB floppy disk drive
- Two serial/one parallel ports
- IDE floppy/hard drive controller
- 101-style enhanced keyboard

33MHz 386 system — Add $300.00

386SX $699
- 80386SX cpu running at 8/16Mhz (20MHz with cache read option)
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- 80387SX co-processor support
- 1.2MB or 1.44MB floppy disk drive
- IDE Floppy/hard drive controller
- Two serial/one parallel ports
- 101-style enhanced keyboard

DISPLAY OPTIONS (Card & Monitor)				
MONO	VGA MONO	EGA	VGA COLOR	VGA 1024x768
$129	$249	$449	$475	$649

HARD DRIVE OPTIONS						
40MB	60MB	100MB	200MB	300MB	750MB	
$449	$449	$599	$649	$1499	$2499	


386SX-16 SL

386SX-16 SL $899
- 80386SX 16MHz cpu
- 2MB memory (up to 4MB memory opt.)
- 80387SX co-processor support
- 1.2MB or 1.44MB floppy disk drive
- Onboard IDE floppy/hard disk controller
- On-board VGA adaptor
- Four available slots
- Two serial, one parallel ports
- 101 keyboard

386 LAPTOP $1999
- 80386SX 16MHz cpu
- 1MB memory (up to 4MB memory option)
- 1.44MB floppy disk drive
- 40MB hard drive (28ms)
- Two serial/one parallel ports
- High-resolution VGA gas plasma display
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33 Cache Systems!

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IMPRESSIONS



FIRST LOOK ▪ By Michael J. Miller

Lotus Improv Spreadsheet for The Next System Offers Some Unique, Helpful Advantages

Lotus Improv, a new spreadsheet for the Next computer, has gotten a lot of attention recently. I've been using a pre-release version of the program and have discovered that Improv's unique approach to the spreadsheet problem offers some intriguing advantages.

Many of the concepts in Improv have been seen before in other products. With its multiple ways of viewing your data, it has some similarities to Javelin and TM/1. Its focus on working with sets of information (such as whole rows or columns) reminds me of the nearly forgotten PFS Plan. And its capability to let you group together items and expand and collapse them is similar to the Budget Express add-in for 1-2-3. Lotus has brought all these concepts together and come up with a product that is distinctly different from any of its predecessors and very different from 1-2-3.

A new Improv spreadsheet looks like a tiny spreadsheet with a single row and a single column. Your first step is to define *categories* — equivalent to the axes of your worksheet. You might define Period as the original horizontal category across the top and Line Items as the category down the side. Then you divide the categories up into *items*, which act as the individual rows and columns. Period might have 1stQ, 2ndQ, 3rdQ, and 4thQ as items (corresponding to column headers), and Line Items might include Net Sales, Rent, and Payroll (corresponding to row titles). You refer to individual cells as the intersection of the two item names, i.e., "Netsales.1stQ."

Within a category, you can group items together, such as grouping together Rent, Electricity, and Heat as "Overhead." You can also easily add a summary to a group, such as Total, Average, or Maximum. Additionally, you can collapse or expand groups to control the level of detail that is visible. I find this kind of "spreadsheet outlining" to be very useful, and expect to see it in a lot of spreadsheets in the future.

Improv handles formulas in a unique and useful manner. Instead of entering your formulas into the cells, you enter them in a "formula pane," which appears on the bottom of each worksheet. Because each item has a name, formulas can have English-like statements, such as: Operating Income = Net Sales-Operating Expenses



Improv has features that will probably spill over into PC-based spreadsheets, including "outlining" and sheet annotation.

Unlike traditional spreadsheets, Improv automatically applies its formulas to the appropriate categories and items. This cuts down on the chance of an error in creating a spreadsheet model. In places where formulas overlap, such as the intersection of a Total row and a Total column, Improv tells you and lets you choose the appropriate formula.

While you might start with two categories in a model, you can easily add more. For instance, you might add an extra category called Offices, which could contain the items Eastern, Western, and Southern. When you have more than two categories, you can easily change the way you look at the data. For instance, you could have Periods be the main heading across the top, with separate columns for each office in each period (maintaining line items as rows). Or you could make a three-dimensional view, with multiple sheets, so you could see line items by period, with each office on a separate sheet.

The ability to change the way you view your categories, plus the ability to do group collapsing and expanding, gives you an amazing number of different ways to look at data. Improv lets you save up to 100 worksheets and graphs within the same model and view the various elements, including the multiple views of individual worksheets, via a model browser.

Improv does have some problems, including the lack of a macro language, external database access, or an undo feature. But it does have a lot of wonderful, innovative features that work remarkably well together, and it's the most interesting spreadsheet I've seen in a long time.

The $695 product is expected to be available shortly and will require a Next machine with Next Step 2.0 system software.

Lotus Development Corp., 55 Cambridge Parkway, Cambridge, MA 02142; (617) 577-8500.

BACKUP SOFTWARE

Central Point Backup Improves the Look of an Already Useful Product



The PC Tools Deluxe package of DOS utilities has long been a good buy, even if you wanted to use only a part of it. Now Central Point Software is releasing the backup program from PC Tools (see product comparison, Page 67), along with the package's scheduler, as a stand-alone program.

Most of the changes in the new product, of which we saw a beta version, are cosmetic. The name has been changed to Central Point Backup on both the deluxe package and the $99 stand-alone version. The only new functionality is the capability to restore and back up from the DOS command line. The scheduler, previously accessible only via the PC Tools desktop, is now built into the main menu's configuration option.

The most obvious difference you'll see is a snazzy new interface, which is even more Microsoft Windows-like than its predecessor. Instead of making you search for information about your backup on a status line at the bottom of the screen, Central Point Backup divvies up the information into five easy-to-read display windows with titles. The Settings window lists the source and destination drives and your predefined setup, if there is any. The Statistics window displays the number and size of directories and files currently selected. Using the tab key (or mouse), you can toggle between a simplified Directory Tree window and a list of files that changes according to which directory is highlighted.

The backup scheduler also has an updated, easier-to-use look, offering check-off boxes for choosing the days of the week on which you want your predetermined set to back up.

Making a backup with Central Point Backup is easy and intuitive. During and after backup, progress windows keep you informed about what's going on, including how many files are being backed up and how much compression was achieved. When we tried to use a disk in the backup set we'd already used, the program notified us and gave us the option of overwriting or replacing it.

Central Point Backup, set to ship by the time you read this, promises to be an even easier to use stand-alone version of an already solid utility within PC Tools Deluxe. Both products will be upgraded in tandem.

Central Point Software, 15220 N.W. Greenbrier Parkway, No. 200, Beaverton, OR 97006; (503) 690-8090, fax: (503) 690-8083.

— Carla Mathews

MACINTOSH MACRO UTILITY

Quickeys 2 Adds Productivity by Offering Keyboard Shortcuts



CE Software's Quickeys 2 Macintosh desk accessory (DA) is made for Type A personalities who regret spending extra seconds reaching for the mouse when a quick keystroke combination can accomplish the task. Quickeys 2, a $149 enhanced version of the original Quickeys DA, lets you assign keystrokes to functions as varied as launching an application or automatically saving a file at specified intervals. You can insert preformatted, specified text, such as a return address for business letters, with just one keystroke. This can save time and enhance productivity.

If you have an extended keyboard, Quickeys 2 lets you use the function keys, as well as keys such as Home and End. You can create separate Quickeys combinations for each application you use, or you can assign them to the Quickeys' Universal keyboard. New to this version of Quickeys is the capability of adding third-party extensions. CE Software includes several extensions with the program, including Mounty, which automatically mounts your Appleshare volume when you boot up.

Taking the program beyond mere convenience is the capability to record sequences, enabling you to carry out multistepped operations with one keystroke combination. You can edit or add to sequences after recording them, or paste in portions of other sequences. In addition, you can record keystrokes in real-time, to make a training "tape" that reveals the steps required for a particular action. This is a particularly handy application for interactive training, and could even be applied among workgroups. The extra edge in productivity that Quickeys 2 provides can quickly become addictive. You won't want to operate a Mac without it.

CE Software, P.O. Box 65580, Des Moines, IA 50265; (515) 224-1995.

— Elizabeth Eva

PHONE DIRECTORY

800-Number Database, Dialer Finds Numbers Fast

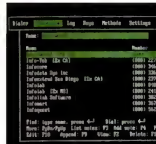
General Information's Hotline Toll-Free 800 is a handy package that combines a phone book and dialer with AT&T's 800-number database of about 117,000 numbers. Installing and using this package is a snap; however, the 800-number directory is spread across 10 disks and takes nearly 16 megabytes of hard disk space. Fortunately, you can install only selected portions ("Mobile Homes," for example) to cut down on disk space consumption. The program can be run memory resident, in which case it can take as little as 3K of conventional RAM if you have EMS.

Not one to skimp, I installed the entire directory. The AT&T data is certainly complete, and I found searching to be lightning-quick (on my 20-MHz 386). It took about the same time to find the record for "Xerox" as "Avis." However, searching for patterns within a company name is too slow to be usable.

The program will dial the numbers you find, if you have a modem attached to your phone line. When you pick up the handset, you can tell the program to record the time you spent on the phone. While you're on the phone, the program pops up a little note-taker screen. Notes get saved with their phone record.

Hotline can also be used to manage your own phone books. It's easy to create a new data file and add entries to it, and you can import data from Dbase files. Included utilities print directories and mailing labels.

Unlike a lot of phone book programs, Hotline is intelligent about area codes. You can attach an area code to every number. You tell Hotline what your home area code is, and when it dials local numbers, it will omit the area code. If you travel to another location, you tell Hotline your new area code and it will correctly handle dialing the area codes for your new location.



Though Hotline is a 16-megabyte database, portions can be installed separately.

The program will log calls, but it does no reporting (such as the total time spent on the phone with a particular client). However, the data is in ASCII format, so you could export it to a database.

Hotline's call tracking and note-taking features are not extensive enough to qualify it as a personal information manager or a contact tracker, but it will be worth the $59.95 price to anybody who needs the complete AT&T 800-number directory.

General Information Inc., 11715 North Creek Parkway S., Suite 106, Bothell, WA 98011; (800) 882-3900.

— Raphael Needleman

INPUT DEVICE

Mouse Pen Portable Makes It Easy to Point, Click, and Draw on the Road



A ppoint feels that if you use a laptop computer, you should stop mousing around. That's why they have developed the Mouse Pen Portable. Simply put, the Mouse Pen Portable is a pen-shaped pointing device for laptops that does not require a flat surface upon which to operate. While holding it like you would a standard ballpoint pen, two buttons (corresponding to the left and right buttons on a standard mouse) can be activated by your index finger. These buttons don't seem to have the same positive response that a Microsoft mouse has, particularly when performing rapid double-clicks. An interesting feature, however, is the ability to lift the Mouse Pen from whatever surface you are using it on, thus locking the cursor's location on the screen. This allows you to double-click an item without moving the cursor. As advertised, the Mouse Pen can be used by "drawing" on your pant leg (as well as other surfaces you can normally write on). This felt a bit strange at first, but I could quickly see how this would allow for use in confined spaces (or any place where your lap is the work space of choice).

With a feature called "dynamic gain," the Mouse Pen monitors the speed and direction of its movements. When the pen is pulled quickly, the cursor jumps across the screen rapidly; when moved slowly, the cursor slows down to a crawl. This gives fine control when drawing.

The Mouse Pen is Microsoft compatible, and the driver supplied is a modified version of Microsoft's mouse driver. By setting parameters when installing the driver, you can control both the vertical and horizontal sensitivity of the pen and its speed threshold. It works with PS/2 and 9- or 25-pin RS-232 ports, and comes with adapters for each. The package includes Telepaint, a standard paint program that, if nothing else, allows you to get a good feel for the Mouse Pen while doodling.

Being very lightweight (90 grams), the Mouse Pen borders on flimsiness. It doesn't feel rickety during use, but when dropped on its rolling mechanism from about 12 inches, some pieces scattered. In fairness, they were easily replaced and the functionality of the device was not compromised.

The Mouse Pen Portable won't replace the mouse on the desktop, but it fills a niche for those using laptop computers. Within that niche, it is a novel and effective replacement for a mouse on the road. The list price is $149.

Appoint, 1332 Vendels Circle, Suite 101, Paso Robles, CA 93446; (805) 239-8976.

— Steve Irvin

FILE TRANSLATION SOFTWARE

Convert It Changes Hypercard Stacks to Tool Book Apps

The similarities between Apple's Hypercard and the Windows-based Tool Book from Asymetrix have not been lost on Heizer Software. The company recently released Convert It — a file format utility (developed by the Hypermedia Group) that converts Hypercard stacks to Tool Book books. Currently, the translation process is a one-way street. You cannot convert Tool Book files to Hypercard format.

On the Macintosh side, Convert It is a Hypercard stack and is a snap to use. When opened, it displays a simple three-button menu from which you can export a stack, export a folder of stacks, or set the export options.

Convert It's export options menu lets you select which parts of a stack are transferred, such as its scripts, backgrounds, home stack information, and the contents of each card. This data is then saved in a Hypermedia Interchange File Format (HIFF) file. Once a HIFF file has been created, it must be transferred to a PC-compatible system. Convert It has no internal file transfer capabilities.

On the DOS side, Convert It is a Tool Book file (or book), and the opening menu looks much like its Hypercard counterpart. The Tool Book edition has two buttons: one to import a HIFF file and the other to set import options. The latter lets you control the import of page and background graphics, adjust the proportions of the image, convert icons to paint objects, and manage fonts.

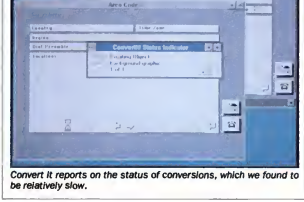
Convert It may be easy to use, but it's certainly not fast. I transferred the Area Code sample stack (127 cards) that comes with Hypercard from a standard Mac SE to a 16-MHz 80386SX. Convert It took slightly more than 30 minutes to convert the stack into the HIFF file. It took another 30 minutes to build a Tool Book book, and to import the data from the HIFF transfer file.

However, once finished, I was surprised at how well Convert It recreated the Area Code stack. Not only did the buttons function correctly, but the screen was exceptionally accurate.

Convert It lists for $199. If you have Hypercard stacks and you want to duplicate them in the Windows environment, you will want Convert It.

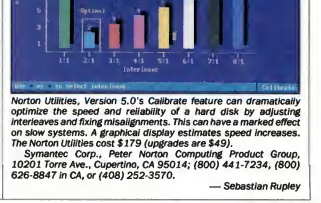
Heizer Software, P.O. Box 232019, Pleasant Hill, CA 94523; (415) 943-7667, (800) 888-7667 (orders only).

— Tracey Capen



Convert It reports on the status of conversions, which we found to be relatively slow.

QUICK LOOK



Norton Utilities, Version 5.0's Calibrate feature can dramatically optimize the speed and reliability of a hard disk by adjusting interleaves and fixing misalignments. This can have a marked effect on slow systems. A graphical display estimates speed increases. The Norton Utilities cost $179 (upgrades are $49).

Symantec Corp., Peter Norton Computing Product Group, 10201 Torre Ave., Cupertino, CA 95014; (800) 441-7234, (800) 626-8847 in CA, or (408) 252-3570.

— Sebastian Rupley



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BUYERS ADVISORY PAGE

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ANSWER LINE. Contributing Editor Brett Glass answers reader questions on technical issues in this weekly column. Glass cannot answer questions personally and will not make brand name recommendations. Readers can leave their questions for Glass by calling (800) 227-8365, ext. 622 or messaging him on Compuserve (72267,3673).



ANSWER LINE

Compaq Speed Claims, Netware Connections

BY BRETT GLASS

This week contributing editor Brett Glass begins a weekly column answering readers questions on technical issues. For information on how to contact him or other *InfoWorld* information services, see accompanying box.

Question: *Compaq claims that its Deskpro 486/33L is 33 percent faster than a 25-MHz 486. Does that mean it does the work in three-quarters of the time? It also claims to be three times faster than a 33-MHz 386. Does that mean it does it in one-third of the time? Sometimes these ratings are confusing, and I'm wondering: Is this like stereos used to be, where everybody makes up their own ways of saying things so that nobody really knows what the ratings mean?*

Response: Conflicting performance claims are, indeed, among the most confusing aspects of computer advertising. To paraphrase Mark Twain, "There are lies, damn lies, performance claims, and ship dates." To get beyond the hype to the truth of the matter, you'll need to understand two key concepts: performance factors and performance metrics.

A *performance factor* is a characteristic of a machine that may have an effect on a system's performance. Examples of performance factors include CPU clock speed, the type of hard disk interface on your system, the presence or absence of a memory cache, and the data rate of your network.

A *performance metric,* on the other hand, is a measure of actual system performance in a specific situation. Benchmarks, such as Norton's SI, Landmark, and *InfoWorld's* own benchmarks, are performance metrics. A performance factor may or may not influence the performance of a system as measured by a performance metric. The results will depend on the task at hand and the way the parts of your system interact.

Thus, to say that a system has a faster clock speed — 33 MHz as opposed to 20 or 25 — does not necessarily mean that the system will perform a given task more quickly. *InfoWorld's* review this week of the Compaq Deskpro 486/33L (Page 102) actually shows that there are some performance metrics in which Compaq's Systempro 386-840 outperforms the 486 system. You may be able to predict that an increase in a specific performance factor ought to speed up a particular job. But before you spend your hard-earned cash, it's always a good idea to perform empirical tests. The results may surprise you.

Question: *What is the best way to connect a Novell network to an HP 3000 host running MPE/XL?*

Response: Hewlett-Packard now has products that let the HP 3000 participate in both Netware and LAN Manager networks. If you stick with Novell, you have two immediate options and one long-term option.

HP's NS LAN Gateway, which runs on a dedicated PC, links a Novell network to an HP 3000. Using the gateway, you can log onto the HP 3000 from a workstation, and perform file transfers, while simultaneously accessing your Netware server. If you run HP's New Wave Office for MPE on the 3000, you can also take full advantage of New Wave workgroup applications.

Your second option is to install TCP/IP software on both the HP 3000 and on the workstation(s). This will allow you to transfer files, exchange electronic mail, and log into the mini using standard Internet protocols. I know of three vendors who supply TCP/IP implementations that coexist with Netware on a PC: Excelan (now part of Novell), Racal Interlan, and The Wollongong Group. HP and Wollongong supply TCP/IP for the HP 3000. TCP/IP may be less efficient than Netware for some applications, but it provides almost universal connectivity. Also, if a workstation does not need access to the Netware server but only to the mini, you may be able to save RAM by using only the TCP/IP software on that machine.

Your third potential long-term option is a product that's been announced but hasn't been released yet: HP's version of Portable Netware for the HP 3000. If you want to learn more about networking your HP minicomputers, I recommend that you contact an HP sales office and ask for two books: the *HP Networking Specification Guide* and the *Buyer's Guide to HP Networking.* Both have invaluable information that will help you integrate any HP machine into a corporate network.

Question: *Is the BIOS compatibility problem finally put to rest now? Should people be concerned about buying a Phoenix BIOS vs. some other BIOS if they're not buying an IBM machine?*

Response: BIOS compatibility has become less and less of a problem in recent years for three reasons. First, the quality of the BIOSes available from all vendors (including Phoenix, Award, and AMI) has continued to improve over time — as have the implementations (such as Compaq). Second, software writers are relying less and less on the BIOS. In order to obtain optimal performance, they're going directly to the hardware, making BIOS compatibility a non-issue. Finally, there are now many published documents explaining the intricacies of BIOS compatibility, allowing any well-read author to produce a compatible BIOS.

If you're very worried about BIOS compatibility, you may want to stick with one of the "name brands" mentioned above. But if your machine contains some other manufacturer's BIOS, don't lose any sleep over it. Odds are you will not experience any problems — and, if you do, a fresh set of ROMs to solve the problem are easy to come by. □

RESOURCES

● OCTOBER

19-21, Scottsdale, AZ: The Independent Computer Consultants Association (ICCA) Fall Conference. Contact: (800) GET-ICCA.

21-24, New York: The CMA Telecom 90 annual conference and exhibition is targeted at telecommunications managers. Location: New York Hilton and Towers. Contact: (800) CMA-EXPO.

22-24, San Francisco: The Electronic Messaging '90 conference will offer multiple tracks including messaging integration with EDI, LAN user issues, gateways and connectivity, and groupware. Contact: Electronic Mail Association, (703) 522-7111.

24-26, Seattle: Microsoft is sponsoring a Word Users' Conference that will offer a series of hands-on workshops. Contact: (800) 468-0822.

29-31, Portland, OR: Eighth annual Pacific Northwest Software Quality Conference. Location: Oregon Convention Center. Contact: Terri Moore, (503) 223-8633.

29-November 1, Boston: Electronic Imaging East will offer a variety of technology demonstrations. Location: Hynes Convention Center. For further information, contact: BIS CAP International, (617) 893-9130.

● NOVEMBER

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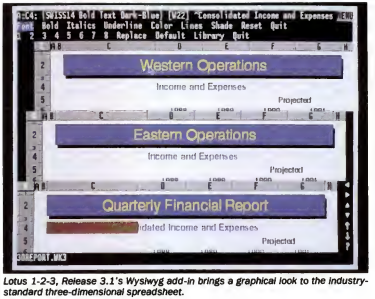


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REVIEWS



Lotus 1-2-3, Release 3.1's Wysiwyg add-in brings a graphical look to the industry-standard three-dimensional spreadsheet.

Lotus 1-2-3, Release 3.1 Has Publishing-Quality Output

Long-awaited update has dual menus; requires considerable ramp-up time for novice users.

BY JOHN WALKENBACH CONTRIBUTING EDITOR

Lotus has finally bestowed its high-end spreadsheet with features that might make it competitive with the new graphical spreadsheets, those products that generate publishing-quality output. The new 1-2-3 also has a new memory management scheme that allows it to run under Windows 3.0 as a DOS task. Without a doubt, this new entry into the high-end spreadsheet arena is aimed at those who want a graphical interface as well as presentation-quality output.

In terms of features, the product is a vast improvement over the initial version, which received high scores in our July 17, 1989, review and our January 22, 1990, product comparison. But the spreadsheet market has changed rapidly since Release 3.0 hit the market. Consequently, the after-the-fact graphical face-lift is an improvement but doesn't quite cut it in many ways — especially for those experienced with true GUI spreadsheets such as Excel, Wingz, or Lotus' own 1-2-3/G for OS/2 Presentation Manager.

For those expecting a completely overhauled graphical version of 1-2-3, Release 3.1 may be a disappointment. Lotus has demonstrated with 1-2-3/G that it's possible to maintain the original qualities of 1-2-3, but in a graphical environment. Borland's Quattro Pro shows that it's even possible to grow a text-based program with features such as resizable windows, pull-down menus, and true mouse support (although there is no on-screen font support). Release 3.1 is obviously an interim solution — which is fine if that's all you're expecting. Without a doubt, there are a lot of 1-2-3 users out there who will be more comfortable moving to this spreadsheet than to an entirely new one.

FEATURES:

The original release of this product included versions for DOS and OS/2. Release 3.1 is available only for DOS, and retains all the features of Release 3.0.

Some time ago, Lotus acquired PC Publishing's Impress add-in. The add-in was adapted for Release 3.1 and is now called Wysiwyg. Like Allways, the publishing add-in supplied with Release 2.2, Wysiwyg is an optional program that converts the text display to bit-mapped graphics, and it provides the means to incorporate graphs with text and also change spreadsheet formatting in terms of fonts, type sizes, line drawing, and shading.

But unlike Allways, Wysiwyg gives you access to all of the spreadsheet commands while you're in graphics mode. Therefore, it's reasonable to attach Wysiwyg automatically and never switch to text mode — assuming you can spare the additional 150K or so of conventional RAM it uses.

Wysiwyg has its own menu system, accessible with the semicolon key (pressing slash brings up the normal 1-2-3 menu). These two menus are completely independent of each other. For example, a print range specified in normal text mode isn't recognized if you print from Wysiwyg. With Wysiwyg loaded, you can optionally use a mouse to access the menus — which are the standard horizontal "moving bar" type menus. You can view three different spreadsheets or spreadsheet pages at a time, but you have no control over window size or placement.

The Windows compatibility touted for Release 3.1 means nothing more than its capability to run under Windows as a DOS task — something the original version could not do because of a conflicting memory management system. As such, Release 3.1 can't take advantage of Windows video drivers or printer drivers.

PERFORMANCE:

We score performance based on the expanded *InfoWorld* spreadsheet report card found in our January 22 product comparison on spreadsheets. The Wysiwyg add-in was attached during all testing and performance evaluation, and for comparison purposes we considered this to be a graphical spreadsheet. We installed and used the product on three 80386 systems, with 1, 4, and 8 megabytes of RAM, respectively. We ran the program directly under DOS and also as a DOS task under Windows 3.0. This review focuses primarily on the new features; for additional details, see our previous product comparison of Release 3.0 (January 22, Page 57).

This latest release adds nothing new in terms of analytical features, and our good rating for formulas and analysis remains unchanged.

The Wysiwyg add-in included with Release 3.1 is a significant modification of the Impress add-in that's also available for Release 2.2. Lotus made major changes to the command menu, so it more closely resembles Allways. Wysiwyg generates format files with an FM3 format, and can also read and write ALL format files produced by Allways, as well as FMT files written by Impress. Apart from this, nothing is new in the area of compatibility, and its excellent score is still valid.

Working in the Wysiwyg mode is, of course, much slower than text mode — and also slower than a true graphical spreadsheet such as Excel. It's not uncommon for cursor movements to lag behind your key presses, and screen updating can be sluggish.

Lotus claims the minimum RAM requirement is 1 megabyte. True, it will run under this configuration, but only masochists need to try it. Performance was so sluggish on a 1-megabyte Compaq 386/20 that we gave up after half an hour. The constant disk swapping kept the hard drive light on nearly full time, and there were long pauses between keystrokes and the resulting action. Moving up to 4 megabytes of RAM eliminated such problems.

For speed, *InfoWorld* benchmark tests show Release 3.1 to be somewhat slower than Release 3.0 in most operations, with markedly slower showings in our financial and scientific model recalculations. Speed is good.

1-2-3's database features have not changed with this release. Somewhat surprisingly, Lotus still only ships one Datalens driver to access external databases. The only driver included is a simple Dbase III driver. Nevertheless, database features are strong enough to earn a very good score.

One area that *has* changed is graphics. There are no new chart types, but the Wysiwyg add-in provides a good set of graph customization features, pretty much on par with those found in Quattro Pro's annotation mode, and somewhat reminiscent of Lotus' Freelance Plus. However, any annotations to your graph are valid only in Wysiwyg mode. For example, if you view a modified graph in normal text mode, none of your additions will appear. Similarly, you cannot save an annotated graph to a file for use in another program.

Unlike Quattro Pro, Release 3.1's graph annotation capabilities don't include importing clip-art files, but you can insert CGM files into a spreadsheet just like a graph. These new features make it possible to produce simple on-screen slide shows, complete with text-only slides. Wysiwyg also lets you view hot-linked multiple graphs on-screen in any size desired. Despite a few limitations, there are significant improvements to graphics. Graphics rate a very good score.

Clearly, the most substantial improvement over the initial release is in output. As we noted, the Wysiwyg add-in lets you easily change the formatting of your text, insert live graphs, and see the results on-screen. It uses Bitstream fonts for both screen and printed output. Four type families are included, in sizes from 3 to 72 points. Additional Bitstream typefaces are also available.

ALSO IN THIS SECTION

Actor 3.0 99
Compaq Deskpro 486/33L 102

You can create and store a set of custom styles (font, size, attributes, and color) and apply them quickly to a cell or range. A feature we especially like is the dynamic display of page breaks in Wysiwyg mode. Like Excel, a dotted line indicates where your pages will break and adjusts as you change type sizes or column widths. Also handy is the option to scale an output range so it will fit on a page.

The product worked well with an HP Laserjet Series II printer. But despite our best efforts and two calls to technical support, we were unable to get Wysiwyg to recognize a supported font cartridge in an original model HP Laserjet printer. Rather, the program consistently printed using low-resolution bit-mapped fonts. Because of these problems, we must lower an otherwise excellent output score to very good.

You can use 1-2-3's macro capability in both text and Wysiwyg mode. Apart from this, macro capability remains unchanged from Release 3.0, and we stand by our good rating.

Similarly, there are no new features that affect 1-2-3's consolidation and linking capabilities; it still earns an excellent rating.

As we indicated above, a new memory management system allows Release 3.1 to run under Microsoft Windows 3.0. Lotus provides a PIF file to start the application, but if you use 386 enhanced mode, you need to set an environmental variable to specify the amount of Windows virtual memory you would like to devote to 1-2-3.

Release 3.1 can use either expanded or extended memory, although at least 384K of memory above 640K must be configured as extended.

New to this release is the use of disk-based virtual memory. You can control the size of the swap file via an entry in your AUTOEXEC.BAT file.

Loading Wysiwyg takes about 150K of memory. As noted above, the 1-megabyte minimum RAM requirement is misleading. You'll be much better off with at least 2 megabytes.

Other aspects of capacity haven't changed: You can still load multiple worksheets, each of which can have multiple pages. Our bad experiences on a 1-megabyte machine lower our capacity score to good.

REPORT CARD INFO WORLD

SPREADSHEET SOFTWARE

Lotus 1-2-3

VERSION 3.1

Criterion	(Weighting)	Score
Performance		
Formulas/analysis	(100)	Good
Compatibility	(50)	Excellent
Speed	(75)	Good
Database	(75)	Very Good
Graphics	(75)	Very Good
Output	(50)	Very Good
Macros	(50)	Good
Consolidation/ linking	(50)	Excellent
Capacity	(50)	Good
Documentation	(75)	Excellent
Ease of learning	(50)	Poor
Ease of use	(100)	Satisfactory
Error handling	(50)	Very Good
Support		
Support policies	(25)	Very Good
Technical support	(25)	Satisfactory
Value	(100)	Satisfactory
Final score		**6.7**

PRODUCT SUMMARY

Company: Lotus Development Corp., 55 Cambridge Parkway, Cambridge, MA 02142; (617) 577-8500.
List Price: $595.
Requires: IBM AT, PS/2, or compatible running DOS 3.0 or later; 1 megabyte of RAM; hard disk; EGA or higher graphics display to view graphs or Wysiwyg formatting.
Pros: Multipage spreadsheets; multiple active worksheets; can see the results of text formatting commands; can mix text and graphs; background printing; can work with external database files; publishing add-in is compatible with Allways; graph annotation.
Cons: Two completely independent menu systems can cause confusion; slower performance on 1-megabyte systems.
Summary: This upgrade of Lotus' high-end spreadsheet features an optional add-in that displays the results of your formatting on-screen. Although it is a worthwhile upgrade for users of previous versions, it seems to be an interim solution until Lotus can develop a Windows-based spreadsheet.



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INFO WORLD

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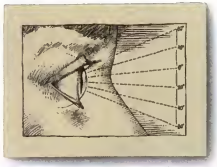
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Our network will put a world of information at everyone's fingertips.

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DOCUMENTATION:

For documentation, Lotus has abandoned the former three-ring binders in favor of a series of seven paperback books. The Wysiwyg add-in is discussed in a separate book. Wysiwyg is fully covered in the on-line help system, which is well integrated with the standard help system.

Both the on-line help and printed materials are thorough and deserve an excellent score.

EASE OF LEARNING:

There's a good chance that anyone who hasn't used 1-2-3 before will be confused by the dual-menu system. If this were a brand-new product (rather than an upgrade of an industry standard), the user interface would be so confusing as to be practically intolerable.

After all, how many spreadsheets have two Print menus, two Worksheet menus, and two Graph menus? Why must you use two different format commands for numbers and text? And why doesn't the mouse work in text mode? Given our knowledge of the evolution of 1-2-3, Lotus' add-in approach is understandable. But newcomers or those experienced with other graphical products will see the user interface for what it is: extra work.

For those experienced with 1-2-3, ease of learning will be satisfactory, but we would not want to subject a novice to this program, with Wysiwyg loaded. Although Wysiwyg is optional (it doesn't have to be loaded), we can rate ease of learning no better than poor.

EASE OF USE:

As described in our original review, this product has a lot going for it in the ease-of-use department. But as a graphical spreadsheet, Release 3.1 is open to competitive criticism. The horizontal bar menu, for example, seems inefficient once you've had experience with more sophisticated pull-down menu systems. Similarly, the lack of resizable windows to display different worksheets is a major omission.

Converting a text-based program to a graphical system — while maintaining complete compatibility — is no easy task, and Lotus probably did as good a job as possible given the circumstances.

This is a complex product that has been made more confusing by adding an entirely new menu system. Although we understand Lotus' motivations in producing this product, it still must be compared to other products. For example, if another vendor released a program with such a convoluted user interface, it wouldn't stand a chance in the market. Balancing the relative ease with which previous users can get up to speed with the difficulties new users will face, we rate ease of use satisfactory.

ERROR HANDLING:

There are few new features that affect error handling, although it is important to point out that the program's undo feature also works in Wysiwyg mode.

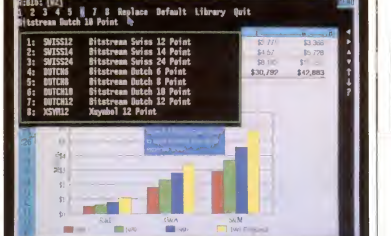
There is one important issue that's relevant to error handling. If you use Wysiwyg, each worksheet file requires a separate format file. Besides requiring more disk space, this also means that you must remember to copy both files when you transfer a worksheet between systems. In addition, a file that has been formatted with Wysiwyg must be edited with Wysiwyg active, or the formatting will not match when you subsequently attempt to format it. Error handling is very good.

SUPPORT:

Lotus provides six months of unlimited toll-free support that's available 24 hours a day, seven days a week. Support policies are very good.

Our first call to technical support was to determine why Wysiwyg was ignoring the font cartridge in an original Laserjet. After several busy signals, we were connected to a technician who put us on hold for the better part of our half-hour call. She was stumped and promised a callback — which we're still waiting for.

We had better luck on a weekend, and spoke with an enthusiastic and knowledgeable rep. We average our two experiences and come up with a satisfactory technical support score.



Lotus 1-2-3 3.1's Wysiwyg add-in makes it possible to easily change the formatting of text and insert live graphs.

VALUE:

Release 3.1 lists for $595, which is $100 more than most other spreadsheets, including Excel and Quattro Pro, its two strongest competitors. Registered owners of 3.0 can upgrade for the reasonable price of $35 (or for free if you purchased 3.0 after May 7). The upgrade cost for Release 2.2 owners is $75, and $150 for versions prior to Release 2.2.

This product is a powerful spreadsheet, but it seems an interim solution until Lotus can bring a Windows version of 1-2-3 to market. Although it is true that Wysiwyg does not have to be loaded, without it this isn't much of an update.

If you currently use Release 3.0 and want to improve your output capabilities, the modest upgrade fee will be well worth it. Similarly, 1-2-3 2.2 users who find they need more power are also good candidates for this product — assuming their hardware will support it. But for users who are looking for a graphical spreadsheet, our advice is to consider Excel, or wait for a Windows version. Lotus 1-2-3, Release 3.1 is a satisfactory value. □

Contributing editor John Walkenbach is consumer research manager for a leading savings and loan association in Southern California.

BENCHMARKS — INFO WORLD

High-End PC Spreadsheets — 386-Based Tests

	Lotus 1-2-3 (2.2)	Lotus 1-2-3 (3.0)	Lotus 1-2-3 (3.1)	Lotus 1-2-3/G
CALCULATION				
Arithmetic model				
Recalc partial	1.6	0-1.5	0-1.9	0-2.7
Recalc all	3.2	4.5[3]	4.2[3]	0-9.1
File load	8.5	9.9[1]	9.3[1]	38.0
File size	240K	214K	214K	340K
Financial model				
Recalc all	17.5	0-39.5	0-42.1	0-1:04
Scientific model				
Recalc all	6.8	0-10.6	0-15.7	0-16.9
CONSOLIDATION				
Page-oriented model	N/A[2]	<1[3]	<1[3]	<1
File-oriented model	N/A[2]	3.4[3]	3.7[3]	<1

All times in seconds.
Times reported as ranges indicate when cursor control is regained until background recalculation has updated the entire worksheet.
[1]Load time includes background recalculation.
[2]Cannot load more than one worksheet into memory at one time.
[3]Does not perform background recalculation in manual mode.
* All products tested with Compaq Deskpro 386/20e with 4 megabytes of RAM, no coprocessor, and a 100-megabyte hard drive.
† 1-2-3/G tested with Compaq OS/2 1.1, with DOS compatibility box disabled.

BENCHMARKS — INFO WORLD

High-End PC Spreadsheets — 286-Based Tests

	Lotus 1-2-3 (2.2)	Lotus 1-2-3 (3.0)	Lotus 1-2-3 (3.1)	Quattro Pro
CALCULATION				
Arithmetic model				
Recalc partial	3.9	0-4.7	0-7.5	0-5.7
Recalc all	9.4	13.0[3]	13.7[3]	11.3[3]
File load	30.3	39.3[1]	34.8[1]	39.1[1]
File size	240K	214K	214K	240K
Financial model				
Recalc all	26.0	0-125.2	0-149.9	0-11.3
Scientific model				
Recalc all	13.6	0-36.2	0-92.7	0-25.7
CONSOLIDATION				
Page-oriented model	N/A[2]	1.3[3]	1.3[3]	7.0[3]
File-oriented model	N/A[2]	11.4[3]	12.1[3]	<1.0

All times in seconds.
Times reported as ranges indicate when cursor control is regained until background recalculation has updated the entire worksheet.
[1]Load time includes background recalculation.
[2]Cannot load more than one worksheet into memory at one time.
[3]Does not perform background recalculation in manual mode.
* All products tested with Compaq Deskpro 286 (8-MHz) with 640K of conventional plus 1 megabyte of expanded memory, no coprocessor, and a 40-megabyte hard drive.

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HEWLETT PACKARD

Actor Offers a Sophisticated OOP Development System

Version 3.0 supports all of Windows' features, as well as embracing traditional OOP concepts.

BY DON CRABB CONTRIBUTING EDITOR

The Whitewater Group bills Actor, Version 3.0 as a complete object-oriented development system for Microsoft Windows 3.0 that competes with other Windows 3.0 development tools such as Knowledge Garden's Knowledge Pro (see review, October 1, Page 90) and Asymetrix's Tool Book (see review, July 9, Page 63).

Like Knowledge Pro, Actor is no newcomer to the development field; Version 2.0 of the program was designed for use with Windows 2.1, though it will also run under Windows 3.0. Unlike Tool Book and Knowledge Pro, however, Actor is designed for the sophisticated application developer who is well versed in working with object-oriented languages. It could also be just the ticket for old-guard procedural programmers trying to get a handle on object-oriented programming (OOP) and Windows 3.0.

REPORT CARD — **INFO WORLD**

WINDOWS 3.0 DEVELOPMENT TOOL

Actor
VERSION 3.0

Criterion	(Weighting)	Score
Performance	(400)	Very Good
Documentation	(80)	Good
Ease of learning	(40)	Good
Ease of use	(120)	Good
Error handling	(80)	Excellent
Support		
Support policies	(40)	Poor
Technical support	(40)	Very Good
Value	(200)	Good
Final score		**6.9**

PRODUCT SUMMARY

Company: The Whitewater Group, 1800 Ridge Ave., Evanston, IL 60201; (708) 328-3800.
List Price: $895.
Requires: PC AT or compatible; Microsoft Windows 3.0; MS-DOS 3.1 or higher; 640K memory (one 360K or 720K disk drive and a hard disk; mouse or pointing device.
Pros: Easy to learn for experienced object-oriented programmers; fast performance; no run-time fee required; supports external functions and DDLs for C, Pascal, and assembler.
Cons: Expensive; lacks Knowledge Pro's expert system and hypertext features; native-mode Actor applications are not compliant with Windows' multiple-document interface (MDI); lacks the help compiler needed to compile Windows help into an application.
Summary: Actor provides a powerful but fairly complex OOP development environment that should appeal to experienced Windows 3.0 developers. Novice programmers and those unfamiliar with OOP constructs may prefer the more approachable environment offered by Knowledge Pro.

FEATURES:

Actor supports all of Windows 3.0's features, including Dynamic Data Exchange (DDE), hot links, and dynamic link libraries (DDLs) written in C, Pascal, or assembler. This means that your Actor application will be able to pass information back and forth to other applications. The program includes everything you need to create and run a fully functional Windows 3.0 application, including a very fast incremental compiler; an interactive debugger; object and class browsers; a proprietary OOP language reminiscent of a hybrid C/Pascal (with a liberal measure of Smalltalk thrown in); a set of class libraries including over 100 classes (such as windows, dialog boxes, menus, buttons, and list boxes), so you don't have to start from scratch; and excellent file editors. These editors actually process commands and let you modify them on the fly — very much a Smalltalk-derived feature.

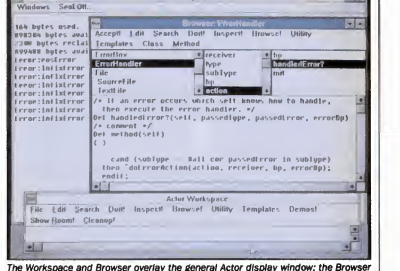
In addition, Actor embraces standard OOP concepts. (For an explanation of OOP terminology, see our OOP product comparison, April 30, Page 59). To create an Actor application, you have to remember that everything is an object: numbers, arrays, files, windows, dialog boxes, etc. As with other OOP systems, an Actor object incorporates both data and functionality. This makes Actor objects completely reusable in a variety of ways.

You create an Actor application by first adding new kinds of objects to those supplied in the class libraries, and then defining how these new objects behave (their methods). Like other true OOP systems, Actor lets objects contain other objects (called instances). Actor objects communicate using a standard OOP messaging system that will be instantly familiar to any Smalltalk, Hypercard, C++, or Object Pascal programmer. For example:

```
message (receiver, arg1, arg2,...); {this is the
syntax of a message}
draw (actCanvas); {this is an actual
message to draw a Chart}.
```

Like Knowledge Pro, Actor supports polymorphism (the capability to communicate to different kinds of objects through the same message) and encapsulation (where data are kept firmly bound to a method). Polymorphism and encapsulation are fundamental to the success of object-oriented programming because they let you concentrate on what you want to do, rather than how to do it. Actor also supports the OOP concept of inheritance, making it easier to spawn new classes based on existing classes.

Each of Actor's development tools is well integrated within the Actor environment. They take the form of pop-up windows that let you compile Actor code, inspect an object, and debug the code. You view existing classes and their methods and create new ones using an object or class browser. You compile your code using the Actor Workspace, after which you can view or edit any data values using an inspector. Actor includes a debugger to resolve run-time problems with code or to extend an object.



The Workspace and Browser overlay the general Actor display window; the Browser window displays the code that comprises the Error Handler object.

Because Actor supports Windows 3.0's real, standard, and enhanced memory modes, you can create applications up to 2 megabytes in size (1 megabyte of static memory and 1 megabyte of dynamic memory) within the 16 megabytes of Windows 3.0 virtual address space under enhanced mode (Actor can use all of this 16-megabyte space itself). Given that users' systems typically contain a maximum of 4 megabytes of RAM, the 2-megabyte limit is practical. Though 1 megabyte of dynamic memory is allocated, the program consumes two because it copies objects from one space to another; you wouldn't want to use more than 1 megabyte of static memory, because the floppy mechanism also uses 1 megabyte of static memory. Actor also offers static object- and code-swapping to help conserve memory, so that large applications can run on systems with only 640K.

Unlike its competition, Actor does not fully use the multiple document interface (MDI) of Windows for displaying multiple windows. Actor lets you move browsers and inspectors outside of the Actor display. You can, however, make sure that applications you write with Actor adhere to the MDI standard by creating Windows classes that implement the MDI main window (called the frame window). You also need to implement the MDI child, or client, windows. Because MDI applications work with accelerators differently from non-MDI applications, Actor allows you to alter the application's main event message loop. The capability to edit this message loop should delight seasoned Windows programmers, but this task's complexity may stump less-knowledgeable developers. In short, if you intend to build MDI-compliant applications with Actor, you'll need a couple of very good reference books on Windows programming. A copy of Microsoft's Software Development Kit (SDK) for Windows 3.0 (reviewed September 3, Page 73) wouldn't hurt, either.

The debugger contains Actor's most comprehensive and reliable debugging tools. It's functionally a combination of the browser and the inspector, with the added capability to change active data values, arguments, and methods. You can also interrupt your debugging execution to correct a data error and then resume where you left off. In effect, the only real difference between Actor's debugger and, say, the debugger in Microsoft C, Version 6.0 is Actor's object-oriented programming orientation.

Actor's collections of classes store their data in memory, usually in the dynamic memory area. If you need to increase the amount of dynamic memory available to your application, Actor supports several storage alternatives, including an object storage facility from the Actor Language Extensions 1 Library (once an extra cost, this library is now included free with Actor), and Wintrieve, an ISAM (indexed sequential access method) file management utility also available from The Whitewater Group.

You create a stand-alone Actor application by first "sealing" the application off from the Actor environment and all the memory-consuming classes and methods the environment contains that your application doesn't need). This process creates the EXE file, an application-specific image file that Actor can execute directly. To make the .IMA into a stand-alone application, you need to edit a few of the application's resources and then compile them, attaching them to the finished .EXE file.

You handle these resources in Actor applications much like you do under Microsoft's SDK. The Whitewater Group includes the Microsoft Windows SDK resource compiler (RC), which you can use to compile any Actor application into a Windows executable file. This frees users from needing to have ACTOR.EXE to execute the application. To compile an application's resources, you can also use The Whitewater Group's $195 Resource Toolkit.

Actor does not include tools for migrating Macintosh applications to Windows, nor does it include tools to migrate Windows applications to OS/2. The Whitewater Group doesn't offer versions for OS/2 or the Mac.

Although Actor makes Windows development easy for savvy object-oriented programmers, its orientation, complexity, and plethora of features would overwhelm most novices.

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PERFORMANCE:
We tested Actor on a 20-MHz 386-based Toshiba 5200 laptop with 8 megabytes of RAM, a 100-megabyte hard disk, VGA, an external NEC VGA color monitor, and a Microsoft mouse, running DOS 4.01 and Windows 3.0. Where appropriate, during our testing we used the methods for optimizing Actor's performance and memory management that The Whitewater Group advises.

We did all our testing with Actor fully integrated within the Windows 3.0 environment. Occasionally we also quick-started Actor from DOS by loading Windows and Actor together.

The incremental compiler (which some might consider an optimizing interpreter) and the debugger also worked quite quickly, even when we crowded the screen with a lot of windows.

In general Actor feels considerably faster than Asymetrix's Tool Book and Microsoft's SDK; it's on a par with the performance we found in Knowledge Pro. Actor's performance may surprise professional developers without OOP-systems experience.

As with our previous reviews of Knowledge Pro, the SDK, and Tool Book, we compared Actor to the Macintosh Programmer's Workshop (MPW) and Mac App running on a Mac IIfx. Actor was faster than both the Macintosh programming tools and Next Step on a Next cube, just as Knowledge Pro was.

Because Actor's integrated environment lets you get on with the business of developing instead of tripping over its windows, we rate it a very good performer.

DOCUMENTATION:
The Whitewater Group equips Actor with the best-written manuals we have seen yet for a Windows software development package, surpassing even those for Tool Book. The general discussion of OOP is one of the cleanest and most concise we've found anywhere. Besides the expected tutorial, reference, and appendix sections, Actor's two manuals offer practical information about application optimization and real-world development issues.

The manuals do have a few shortcomings, though: For example, rather than detailing the steps necessary to make Actor applications MDI-compliant, the manual passes you off to "one of the reference books available on Windows programming." There is no on-line help, either.

On balance, Actor's documentation is good.

EASE OF LEARNING:
If you already know something about OOP or have used Actor 2.0, Smalltalk-80, or C++, you should be able to learn Actor 3.0 in a short time. If you are an experienced Macintosh developer trying to port your applications from MPW/Mac App or Think C, be prepared to spend some time getting familiar with Actor and its differences. If you are a DOS programmer with little or no GUI experience, plan to invest a significant chunk of time learning the program. However, in no way is Actor as challenging to learn as Microsoft's SDK. Although learning how to build a workable and simple Actor application is fairly easy, learning to build something interesting and complicated may stump you.

Given the fact that Actor's primary audience consists of Actor 2.0 users and other more sophisticated Windows developers, we rate ease of learning good, one grade below Tool Book's and Knowledge Pro's scores but a level above Microsoft's SDK.

EASE OF USE:
If you've used other OOP systems before, especially Smalltalk or C++, you are likely to be confused by the way Actor implements some of its tools. Having had considerable OOP experience, when we used the tutorial to create an application class, we got a bit confused using the class browser and its language editor. As it turns out, the problems we had were not with Actor, but with our expectations that the class browser would work identically to Smalltalk-80's. Once we surmounted that conceptual hump, we had no trouble using the browser. Our assumptions point out the fact that if, like us, you have considerable experience with OOP development environments, you will need to spend some time "unlearning" them in order to get Actor straight.

Novices who have some programming experience under DOS or Windows (say, with Pascal or C) probably won't have much trouble using Actor. Although the idea of an incremental compiler might be foreign to them, they'll certainly learn to love its speed and its usefulness as a development tool. They'll also learn to love the debugger.

Previous Actor acolytes shouldn't have any trouble using Actor 3.0, especially if they take 15 minutes to read the README file on the installation disks.

The lack of a few niceties, such as a copy of the HC.EXE help compiler (which is part of the Microsoft SDK), makes the environment a bit less complete than

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ERROR HANDLING:
The Whitewater Group includes a full chapter on error handling in the manuals, and it equips Actor with extensive error flagging, handling, and extermination facilities. The Whitewater Group knows that the error handling methods that make sense within Actor (an interactive application) are often ludicrous within your installed application, so they show in the manuals how to redefine error-handling methods as the development process proceeds. Actor also comes with a complete list of possible system errors and solutions to them.

Overall, the program was the best-behaved Windows development environment we've tested yet, staunchly resisting our attempts to crash it.

We rate Actor's error handling excellent.

SUPPORT:
Support policies: Though they back Actor with a 30-day, money-back warranty and offer support via a BBS, the Whitewater Group limits free (but not toll-free) telephone technical support to 30 days, after which you can purchase one of two available support plans. For this reason, we can give them a score no higher than poor.

Technical support: The technical support staff answered each of our calls quickly and efficiently. In one case, the staff person patiently explained the difference between Actor's browsers and Smalltalk's. Technical support is very good.

VALUE:
At $895, Actor includes a stronger and more traditional OOP orientation than Knowledge Pro's ($695), while lacking that program's expert system and hypertext features, which tended to make development a more enjoyable process. We respect Actor for its thoroughly professional feel, unlike the comparatively amateurish feel of Tool Book ($395). It's a tough call to choose between Actor and Knowledge Pro — some developers may want to use both, for different projects.

Given the price of the competition, Actor's price seems a little high (especially if you buy the $500 SDK from Microsoft to develop MDI-compatible applications). To its credit, Actor does include a complete OOP language, editor, debugger, compiler, and many utilities, and you don't have to pay extra to distribute your applications. We rate Actor a good value. □

Don Crabb is the director of laboratories and a senior lecturer for the department of computer science at the University of Chicago, as well as a contributing editor for InfoWorld. He can be reached on Applelink at A0199 and over the Internet at decc@cs.UChicago.edu.

RELATED REVIEWS

WINDOWS 3.0 DEVELOPMENT TOOLS

Knowledge Pro, Version 1.01, October 1

Windows Software Development Kit, Version 3.0, September 3

Tool Book, Version 1.0, July 9

Compaq's 33-MHz 486 Redefines Performance

However, its price makes it more valuable as a server than a workstation.

BY VICTOR R. GARZA TEST CENTER
AND TRACEY CAPEN
ASSOCIATE REVIEWS EDITOR

The just released Deskpro 486/33L is Compaq Computer's most powerful desktop computer. The 486/33L features an EISA bus architecture, separate processor card, and support for large memory and hard disk configurations. This system will most likely become the benchmark for high-performance personal computers.

The Deskpro 486/33L is the first 33-MHz 80486-based system we've reviewed. Consequently we cannot compare its speed with others in its class. However, compared to Compaq's 25-MHz 80486-based Deskpro, the 33-MHz offers significantly better throughput.

In our CPU-intensive test (a combined processing time of Lotus 1-2-3, Release 2.1 and 3.1, Word Perfect 5.1, and Autocad, Version 10), the 486/33L had an average throughput of 8 minutes and 53 seconds. Compaq's 25-MHz 486 came in at 10 minutes and 58 seconds — 23 percent slower.

The Deskpro 486/33L was shipped with a 650-megabyte Maxtor ESDI hard disk. (We typically request hard disks of approximately 300 megabytes for our standard workstation configuration.) In our disk-intensive test (a combination of Dbase III Plus, Dbase IV, and Paradox 386), the Deskpro had a throughput time of 19 minutes and 20 seconds. Compaq's 25-MHz Deskpro 486, with the same hard disk, had a throughput of 25 minutes and 54 seconds — 34 percent slower.

The 486/33L was also quick running our network file server office throughput tests. Its time of 1 minute and 59 seconds (24 workstations) was 28 seconds faster than the Deskpro 486/25 and only 4 seconds slower than the Systempro 386. Its transaction processing and burst transfer speeds were about the same as both the Deskpro 486/25 and the Systempro.

(The Compaq Deskpro 486/25 was reviewed in our network file server product comparison, July 30, Page 55.)

We found no faults with the Deskpro 486/33L in our software compatibility tests. It ran our test communications program (Crosstalk XVI) and a TSR (Sidekick Plus). We also tested two multitasking environments, Desqview 2.3 with QEMM 5.11 and Compaq's MS-OS/2. Under Desqview we ran Lotus 1-2-3, Release 2.2 and Microsoft Word 5.0 in graphics mode. With OS/2 we ran Rbase for OS/2 (a native application) and 1-2-3 in the DOS compatibility box. For added compatibility, the Deskpro can be switched from 33 MHz to 8 or 6 MHz.

We tested hardware compatibility by installing a Hayes 2400B modem, 16-bit Paradise VGA adapter, and 3Com Ethernet network interface card into the 486/33L. We looked for configuration conflicts or problems with these peripherals. We repeated the test after substituting an IBM Token Ring network card for a 3Com board. Our only difficulty was running the Hayes internal modem; it would not work with the system running at 33 MHz. After switching to a slower CPU speed, the modem worked as expected.

Despite its desktop design, the 486/33L has above-average expandability. The system has three external drive bays (one one-third height, and two half-height). An internal bay supports one full-height hard drive or four half-height 3½-inch drives, and Compaq offers optional 240- or 420-megabyte drive arrays. The 486/33L has a maximum storage capacity of 1.3 gigabytes.

The 486/33L's motherboard has seven 32-bit EISA slots, one of which is used by the ESDI hard disk controller. For better expandability, the system's serial ports, parallel port, mouse port, and VGA adapter are built in. It comes standard with 4 megabytes of RAM soldered onto a separate memory board. Using proprietary Compaq memory modules (2-, 8-, and 32-megabyte daughterboards that plug into the memory board), system RAM can be expanded to 100 megabytes. A second proprietary board contains the Deskpro's 80486 CPU, 128K of high-speed static cache RAM, and a Weitek 4167 math coprocessor socket.

Compaq supplies fine documentation with this system. It includes system setup, system overview, and hard disk driver

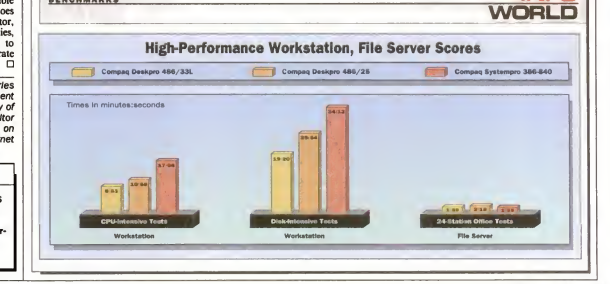


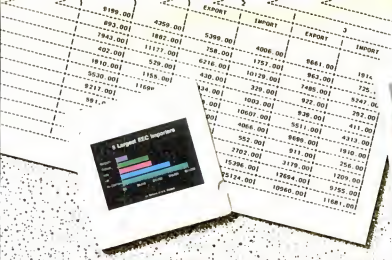
The Deskpro 486/33L's rather simple exterior hides Compaq's most powerful desktop computer.

booklets, plus a spiral-bound user programs reference guide. All contain helpful diagrams, are well organized and easy to read, and are mounted in a three-ring binder. The documentation has, however, a few weaknesses. These include a brief troubleshooting section and thin indexes.

Setup and configuration of the 486/33L is typical of EISA systems. An EISA configuration utility was included on a 3½-inch disk. There are only three jumpers on the motherboard and a bank of dip switches on the hard disk controller. A handy decal inside the case lists the settings for these jumpers and switches. Additional system RAM is easily installed on the removable memory board.

The 486/33L has the same impressive design and construction typical of earlier Deskpros. The power switch is mounted on the front panel and relatively well protected. A removable back panel provides quick access to the internal drive bays. We found no patches or last-minute changes on the motherboard and processor board, and nearly all components were surface mounted. The only major drawback to the 486/33L's design is the use of proprietary memory modules — a feature that can make memory upgrades expensive compared to systems that use standard SIMM panels. (An 8-megabyte memory module for Compaq lists for $4,599, while 8 megabytes of SIMM panels sell for less than $1,000.)







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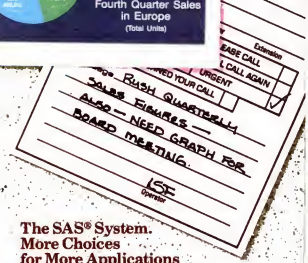
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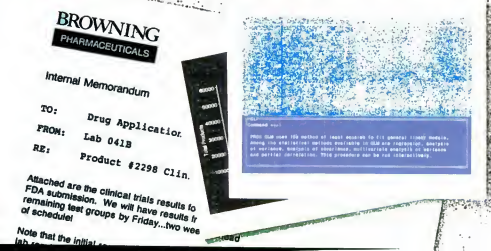
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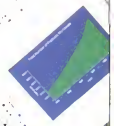
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33-MHz 486 EISA COMPUTER

Compaq Deskpro 486/33L Model 650

Criterion	(Weighting)	Score
Workstation performance		
CPU-intensive applications	(100)	Excellent
Disk-intensive applications	(100)	Excellent
Software compatibility	(150)	Excellent
Hardware compatibility	(125)	Very Good
Expandability	(75)	Excellent
File server performance		
Office applications	(300)	Very Good
Transaction processing	(125)	Good
Burst transfer	(25)	Good
Expandability	(100)	Very Good
Documentation	(50)	Very Good
Setup	(100)	Very Good
Serviceability		
System design	(50)	Very Good
Support policies	(50)	Poor
Technical support	(75)	Good
Value:		
Workstation	(125)	Satisfactory
Server	(125)	Very Good
Final score:		
Workstation		**7.9**
File Server		**6.9**

PRODUCT SUMMARY

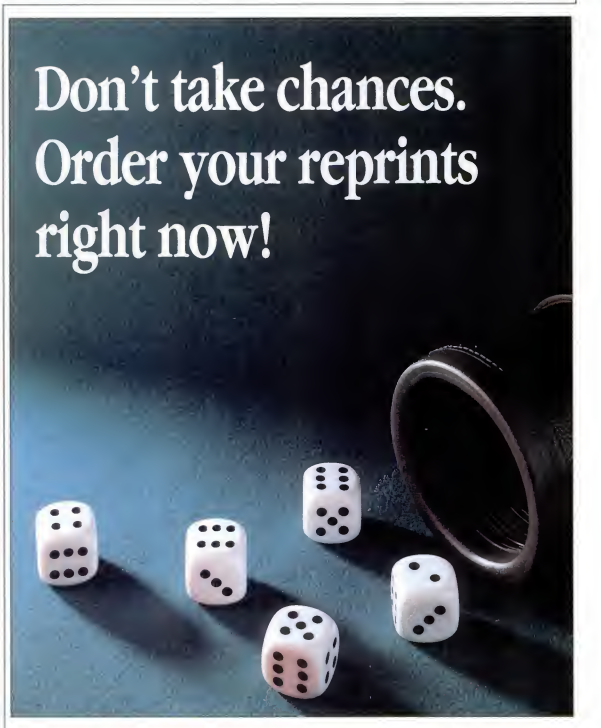
Company: Compaq Computer Corp., 20555 State Highway 249, Houston, TX 77070; (800) 231-0900.
List price: $19,499 for workstation configuration; $21,497 for server configuration; sold through dealer channels.
Features: 33-MHz zero-wait-state 80486 CPU, switchable to 6 and 8 MHz via software; EISA bus; two serial, one parallel, one mouse port built in; 300-watt power supply.
Peripherals: Enhanced keyboard; built-in VGA adapter.
Workstation storage and memory: 650-megabyte Maxtor hard disk with ESDI 1:1 controller; 1.44-megabyte 3½-inch floppy drive; 4 megabytes of 80-nanosecond RAM (SIMMs, 100 megabytes maximum); 128K of RAM cache.
File server storage and memory: Additional 4 megabytes of memory (8 total).
Pros: Exceptional workstation speed; above-average file server speed.
Cons: Expensive; dealer-only support.
Summary: The Deskpro 486/33L sets the standard for its class. If you put performance over price on your list of priorities, the 486/33L is a good choice for stand-alone CAD, heavy duty multitasking, or large financial processing environments. It's also a good choice as a file server for all but the largest networks.

The 486/33L has a nice selection of security features. A case lock is located on the back panel. In addition, there is power-on and keyboard password protection. Compaq's Quicklock option lets you lock the keyboard and mouse port with a user-defined keystroke combination while an application is running. A network server password lets you disable the keyboard, but it also lets the server reboot after an unintended shutdown.

Compaq's support policies are unexceptional. The Deskpro 486/33L is warranted for one year. End-user support is provided by Compaq dealers; there is no direct support provided by the vendor. The quality of support provided by Compaq dealers is based on surveys of *InfoWorld* readers; they rate it good.

Typical of Compaq computers, the Deskpro 486/33L is relatively expensive. Our workstation configuration (4 megabytes of RAM and a 650-megabyte hard disk) has a list price of $19,499, or about $2,000 more than HP's tower-based 25-MHz Vectra 486. Balancing the Compaq's performance against its price makes it a satisfactory value.

Performance is a more important issue than price for network file servers. The Systempro 386 lists for approximately $2,500 more than the Deskpro 486/33L. As a server, the 486/33L has nearly equal performance to the Systempro and a lower price, making it a better value for most network environments. The Systempro, with its multiprocessor capabilities, may become a better value as more network operating systems support multiprocessors and as server applications (such as database servers) become more common. □

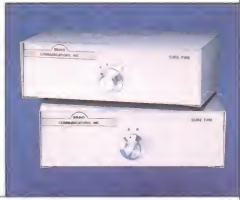


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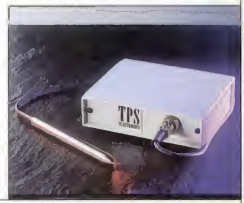


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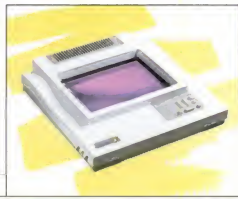


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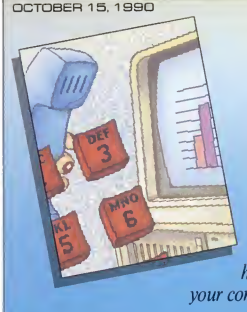
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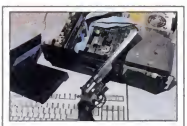
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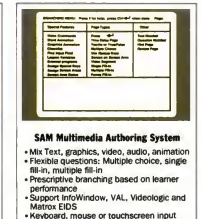
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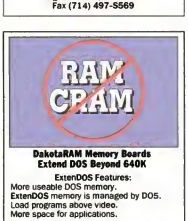


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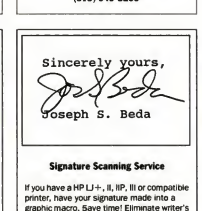
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SNMP

Continued From Page 1

today for managing multivendor networks, 46 vendors demonstrated interoperability across the show-floor network, with more than 100 management station and agent products working together.

"Vendors are investing in SNMP while waiting for OSI; users are not waiting for CMIP," said Phil Fulchino, senior product manager for host connectivity at Banyan. CMIP (Common Management Information Protocol) is an OSI-based protocol intended to provide standard ways to manage large multivendor networks.

While Novell announced its SNMP-compatible Lantern Services Manager (see story, this page), Banyan announced availability of the Vines SNMP Management Information Base (MIB), a database of objects that can be managed on a network. By writing interfaces to the MIB, developers can create programs that manage Vines networks, Fulchino said.

Banyan also showed a prototype of SNMP agent software, which must run on every device managed under the protocol. The company will implement SNMP as a proxy agent, capable of controlling several other devices, a technique that reduces software overhead. Banyan refused to release a price or availability date for the SNMP agent.

3Com, meanwhile, demonstrated another prototype of its network management software due to be released in early 1991. It will support SNMP-based systems from third-party developers, the company said.

While SNMP probably gained converts at the show, even proponents acknowledged that the protocol is far from perfect. The lack of network security features is an issue that scares off some potential customers.

Developed as a management protocol for Internet, the TCP/IP-based network that primarily connects research and academic systems. SNMP wasn't built with security in mind. John Romkey, a developer at Epilogue Technology Corp. of Capitola, California, said SNMP developers will soon add security features to make the protocol more commercially attractive.

One of the strengths of SNMP is its capability for managing anything to which it can be connected. As a demonstration, Romkey showed an SNMP-controlled toaster.

Novell Lantern Services Manager

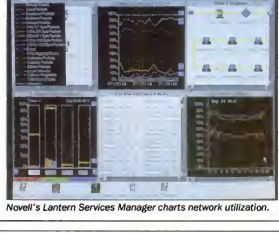
Novell took a major step toward simplifying network management with the announcement of Lantern Services Manager, a Windows 3.0-based network management system that can manage non-Netware networks.

Lantern Services Manager works in conjunction with Novell's Lantern SNMP network monitor, monitoring all Lanterns on the network and logging the information it collects. The program charts network utilization, draws network maps, and allows administrators to set thresholds that trigger alarms. It can also be used to monitor remote networks.

Lantern Services Manager goes beyond SNMP, managing every device on any network running any protocol, regardless of whether the device has an SNMP agent, said Jeff Turner, product manager for Novell's Lanalyzer products division.

Available in January 1991, Lantern Services Manager will cost $4,995. The Lantern network monitor is $4,495 and has been shipping since May 1990. About 15 vendors have written other front ends to the Lantern.

Novell Inc., Lanalyzer Products Division, 2180 Fortune Drive, San Jose, CA, 95131. (408) 434-2300.



Novell's Lantern Services Manager charts network utilization.

Users Are Less Than Eager to Dump TCP/IP for OSI

BY DAVID COURSEY AND JODI MARDESICH

SAN JOSE, CA — Although GOSIP, the Government Open Systems Interconnection Profile, became a mandatory standard for U.S. government computing two months ago, vendors are not falling over themselves to jump on the GOSIP bandwagon.

Twenty-two companies participated in an Open Systems Interconnection (OSI) demonstration at last week's Interop 90 show, less than half the number who were in a showcase for SNMP, the network management protocol used by TCP/IP.

"OSI is something to aspire to, but vendors aren't solving the problems of tying the past to the future," said Mark Freund, president of Interconnect, a network consulting firm in Santa Monica, California.

TCP/IP, which was supposed to be replaced by OSI as the OSI protocols became commercial products, has already become prevalent in multivendor networking, Freund said. Because customers are unlikely to dump their relatively new TCP/IP installations, vendors should concentrate on products that ease the transition to OSI, Freund said.

"By the time OSI gets here, the idea of having just one protocol will be out the window," said John Romkey, a TCP/IP developer at Epilogue Technology Corp., in Capitola, California. Romkey doubts the federal government's purchases of GOSIP-compliant products, which include a subset of OSI, will drive corporations to adopt the new standard.

Despite the skepticism, OSI did move forward at Interop. Novell, Retix, Touch Communications, and Data General all announced products.

Novell gave its largest installed base of users partial GOSIP compliance via the MHS-to-X.400 Gateway codeveloped with Retix. Retix demonstrated the gate, which will give Netware 286 users with Novell's Message Handling Service (MHS) a link to OSI X.400 message systems. The gateway goes to beta test this month and is scheduled to ship in December. Retix's gateway works in conjunction with the Retix Openserver 400, the company's X.400-based message server.

Delivering on a promise made last February, Retix will ship the Openserver 400 for Netware 386 in December. The $5,950 Openserver 400 is a Netware Loadable Module (NLM) that will give Netware 386 users connectivity to X.400 message systems.

Touch communications announced an alliance with Novell to develop an X.400 gateway for Netware MHS.

Novell also demonstrated an FTAM (File Transfer, Access and Management) responder in the Interop OSI demo. (The responder corresponds with a server in client/server architecture.) FTAM defines a file transfer facility for exchanging data in a multivendor OSI environment. The FTAM responder and X.400 gateways together will satisfy GOSIP, Version 1.0 compliance requirements, Novell said.

Lotus

Continued From Page 1

ment. This will automatically bring up the graphics program and load the graphic.

After the user finishes making changes, saves the file, and exits the graphics program, the "embedded" graphic in the word processor document is automatically updated.

The Industry Leaders' agreement to adopt a single standard will likely benefit both users and ISVs.

"We discovered we were all going in the same direction," said David Reed, Lotus vice president and chief scientist for spreadsheets. "It's silly to have an application that only one application speaks to."

CDPS has its roots in three independent efforts by four of the industry's biggest companies.

In July 1989, Seattle-based Aldus Corp. said it was working on a linking technology that was internally called the "Pez protocol," which was due for release by September of that year.

However, Microsoft cooped Pez and merged it with related technology that it's applications division was developing. A draft specification titled "Linked and Embedded Documents" was circulated to ISVs for comment last November.

About the same time, Lotus and Word Perfect began working on a technology to hot link upcoming OS/2 Presentation Manager versions of the two companies' flagship applications. The two demonstrated this technology at Comdex last November. (See "Lotus and Word Perfect Join Forces to Create a 'Hot-Links' Agreement," November 6, 1989, Page 5.)

Although the draft specification has not been released to vendors yet, core features of CDPS are already in Microsoft Powerpoint for Windows, Grabner said. The package contains a separate "server" program called Powerpoint Graph that works in conjunction with the Powerpoint program, which functions as the "client."

Other products implementing CDPS are expected to be demonstrated at fall Comdex in Las Vegas next month, developers said.

AMD

Continued From Page 1

which is set to start November 15. In this phase, AMD hopes to win clear rights to manufacture its version of the 80386 and math coprocessor and will press its claim for more than $500 million in damages.

Despite the judge's finding that it had breached the contract, Intel maintained that it will not have to give AMD rights to the highly profitable 386 chip. "This is not something we're worried about," said F. Thomas Dunlap, Intel's general council. The original contract between the companies established a formula for swapping technology, and AMD's offerings do not match the value of Intel's 386, he said.

AMD may not wait for the remedies ruling to introduce its own versions of the 386DX and 386SX chips. At a press conference announcing the arbitrator's decision, AMD chairman Jerry Sanders stood before an enlargement of the Longhorn, AMD's re-engineered version of the 386DX chip.

AMD is already sampling the Longhorn, and is in the advanced stages of developing the Shorthorn, a re-engineered version of the 386SX, Sanders said. The company had planned to introduce the chip as the AM-386DX until Intel challenged AMD's rights to the 386 name.

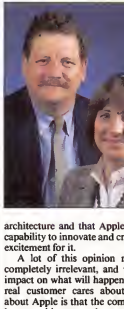
The ruling repeatedly noted that neither Intel's nor AMD's hands are totally clean in the matter. But it found Intel clearly violated the spirit of the contract between the two parties.

The judge called Intel's earlier attempts to keep AMD out of the math coprocessor business by supplying faulty and unusable information on the Intel 8087 coprocessor "extortion," and concluded that it was "a knowing, deliberate, and unjustified breach of contract ordered and approved by the most senior officials at Intel."

AMD's culpability was relatively minor, "a mere blip," the judge said. It centered around a modem chip, the 7910, which AMD supplied to Intel as part of the agreement. After AMD developed a successor to the chip, the judge found "AMD attempted to bad mouth the 7910 then being produced at Intel."

Q&A: QUINDLEN AND ALSOP ■ BY STEWART ALSOP

Apple's Future Looking Brighter as It Enters Multimarket Transition



I am simply amazed by Apple's PR machine. Over the past two weeks, I've read at least a dozen major stories about Apple's change of life (oops, I mean change of strategy) and its introduction of a set of low-cost computers. Virtually every one of these stories said essentially the same thing: We [Apple] have made a lot of mistakes. We're going back to our roots. Our new machines will cover our boo-boos and bring us into new markets like small businesses and the home. And we've rededicated ourselves to the personal computer revolution instead of proving what a great computer hardware company we are.

What was particularly amazing was that somehow Apple managed to tell these reporters what machines were being introduced weeks before the "official" announcement of those computers today, without violating Apple's own nondisclosure policies! Now that's truly outstanding PR.

So now that the official introduction date has arrived and you've been appropriately prepared for the new computers, the question is: What is the future for Apple?

Some people say it's just too late for the company, that the arrival of Microsoft Windows 3.0 has made it impossible for Apple to convert any new business customers to the Macintosh and therefore increase its share of market. Some people say that the Macintosh is an old and tired architecture and that Apple has lost the capability to innovate and create any new excitement for it.

A lot of this opinion mongering is completely irrelevant, and will have no impact on what will happen or what any real customer cares about. The truth about Apple is that the company faces a key transition, one that any truly great company must face at some point in its life. For Apple, that is to finally be capable of competing in more than one market at a time. At various times in its life Apple has been strong in the home market, the school market, the graphic arts market, and the business market, but not more than one market at a time.

The way to discover a reasonable and rational truth about Apple is to evaluate its position in each marketplace, given its new product line. So let's take each market one by one.

- Business market: The truth is that Apple still has a very good story to tell to businesspeople. Now that it has a range of Macintosh II computers, it can legitimately talk to department managers and small-business owners about standardizing on the Macintosh, which it could not do earlier because a lot of managers objected to the lack of expandibility in the Macintosh SE. Combined with the new features of its System 7.0 in networking, applications integration, and connectivity, Apple continues strong in the business market.
- Graphic arts market (meaning designers, publishers, printers, and so forth): Apple's product line incorporates support for storage (through the SCSI port), consistent application of 8-bit color graphics, a relatively inexpensive implementation of 24-bit color graphics, higher quality displays, and easy-to-maintain networking. All of these combine to make the Macintosh a strong proposition for graphic artists.
- Home market: Apple is not going to make a splash in the home market simply because it now has a $1,000 computer. Indeed, IBM has done a masterful job of finding out what people want in a home computer and then giving it to them in the PS/1, in both product definition and distribution channels. Apple has simply made a cheaper version of its original Macintosh, which since then it has sold in computer stores and marketed as a productivity machine.
- School market: Even Apple employees now have a hard time recommending the continued purchase of Apple II computers for schools, and that has hurt Apple tremendously in the school business. In the interim, IBM has taken advantage of Apple's weakness there. But the truth of the matter is that IBM is not well liked by teachers, and Apple is. Now that Apple has both a very cheap hlack-and-white machine (the Classic should go to schools for $500 or so) and an inexpensive color machine (the LC should go to schools for about $1,500 and can run Apple II software well), there's a good chance that Apple can gain a little back from the non-IBM competitors that have benefitted from cheaper pricing.

Looking at Apple's situation realistically, I find a lot of reasons for optimism about the company. So I'm willing to bet that the talk about Apple by June of 1991 will be very positive and the company will once again be considered on a roll.

Stewart Alsop is the editor of PC Letter. *He alternates each week in writing this column with Ruthann Quindlen, vice president at Alex. Brown & Sons.*

NOTES FROM THE FIELD ■ BY ROBERT X. CRINGELY

Big Blue Ejected From SQL Game; Borland Brought in to Earn a Save

Sitting in the bleachers, watching the Oakland Athletics beat the tar out of the Boston Red Sox last week in their fourth and last playoff game, it occurred to me that baseball is just a virtual reality demonstration. Instead of a set of funny goggles and gloves, what we spectators don is the ballpark, and once inside, we accept that the rules of baseball are the rules of life itself.

It's an unforgiving life, too, as Boston pitcher Roger Clemens learned when he was booted in the second inning for swearing at an umpire. With so much at stake, you'd think they'd cut the teams a little slack and limit the prohibitions to things like automatic weapons and tear gas. After all, this *was* Oakland.

TURBOJAZZ PLAYS ARMONK? I was rooting against Oakland, mainly because I am opposed to teams that are the product of selective breeding experiments, and because I've had it with Pammy telling me how cute Jose Canseco's butt is. For all my support, Boston never had a chance.

Even the most powerful of organizations need support from time to time, as IBM is painfully coming to understand. What's at issue in places like Austin and Boca is whether Big Blue still has the stuff to do its own cross-platform SQL code. Sure, IBM *invented* SQL, but that means nothing. I once watched the Japanese inventor of Pac Man get trounced by a 12-year-old.



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Months ago, some major corporate accounts were let in on the bad news that it would be three to five years before IBM could deliver on its promise of SQL transparency across all platforms. "But we can do that already," said a few customers who were beta testing Borland's next Paradox release. As a result, Borland developers have been doing a lot of commuting to points east, helping with the database components of OS/2 Extended Edition. Exit Gates, enter the Kahn.

IBM is also accepting some help, perhaps indirectly, from Macromind, creators of the still-unannounced multimedia extensions to Windows. The news is that what works with Windows in this case will also work with OS/2, as IBM will hype in its Comdex extravaganza. The irony is that most multimedia types plan to develop on the Mac, then port to Windows and OS/2, since the Macromind stuff runs across all three platforms.

INTEL'S BACK IN THE MINORS. Rocket Clemens was on the mound in the second inning, no douht already sore about having such a stupid nickname. Clemens and umpire Terry Cooney had an exchange of data, including a certain amount of hand-shaking and error-checking. When the meaning of Rocket's message was clear — that Cooney's mama was not a nice lady — the pitcher was thrown out of the game, but not before rushing home plate and extending the genetic metaphor to new heights of expression. Still, the ump won.

Jump with me now to Hillsboro, Oregon, where Intel's OEM Platforms Division has just decided to get out of the 486 Unix workstation business that it entered earlier in the year. As Clemens, Intel was thrown out of the game, victim, in this case, to a game of hardball played by Compaq, which had threatened to switch its high-end Unix machines to MIPS or Sparc processors if Intel insisted on selling competing boxes. No word yet on whether Compaq will tolerate Intel's upcoming plan to build a 66-mhz 486 computer to be sold — now here's a change — under the name of a Japanese company.

DELUSIONS OF GRANDEUR. The most important rule in any virtual reality is that there *are* rules, and they have to be obeyed, no matter how ridiculous. Take, for example, the rule at the Oakland Coliseum that required me to show my driver's license in order to buy a beer.

Last week I pointed out that NCR's MIPS ratings on its upcoming 486 machines were very optimistic. It turns out the optimism was Intel's, not NCR's. Through carefully hand-coding the string compare section of the Dhrystone benchmark, Gordon Moore's kids were able to increase apparent performance by 30 percent. The sordid details can be found in the fine print of Intel's *Microprocessor Performance Report 240-734-001.*

JUST PLANE DELUSIONS? Stretching the bounds of *any* reality, I've heard that Commodore and Sun will in November announce that Commodore will take over Sun's Intel and Motorola workstation lines. I'm still not sure I believe this, but the idea is that Sun doesn't want the support burden, while Commodore is desperate to get into the Unix market.

What I *do* believe is Oakland over Cincinnati in five games.

Were Tony LaRussa and Lou Piniella extras in Goodfellas? Call me with an industry secret at (415) 329-3555 and find out.



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